

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

Annual report pursuant to Section 13 or 15(d) of
the Securities Exchange Act of 1934

For the fiscal year ended
December 31, 2021

Commission file
number 1-5805

JPMorgan Chase & Co.

(Exact name of registrant as specified in its charter)

Delaware (State or other jurisdiction of incorporation or organization)	13-2624428 (I.R.S. employer identification no.)
383 Madison Avenue, New York, New York (Address of principal executive offices)	10179 (Zip Code)

Registrant's telephone number, including area code: (212) 270-6000
Securities registered pursuant to Section 12(b) of the Act:

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common stock	JPM	The New York Stock Exchange
Depository Shares, each representing a one-four hundredth interest in a share of 5.75% Non-Cumulative Preferred Stock, Series DD	JPM PR D	The New York Stock Exchange
Depository Shares, each representing a one-four hundredth interest in a share of 6.00% Non-Cumulative Preferred Stock, Series EE	JPM PR C	The New York Stock Exchange
Depository Shares, each representing a one-four hundredth interest in a share of 4.75% Non-Cumulative Preferred Stock, Series GG	JPM PR J	The New York Stock Exchange
Depository Shares, each representing a one-four hundredth interest in a share of 4.55% Non-Cumulative Preferred Stock, Series JJ	JPM PR K	The New York Stock Exchange
Depository Shares, each representing a one-four hundredth interest in a share of 4.625% Non-Cumulative Preferred Stock, Series LL	JPM PR L	The New York Stock Exchange
Depository Shares, each representing a one-four hundredth interest in a share of 4.20% Non-Cumulative Preferred Stock, Series MM	JPM PR M	The New York Stock Exchange
Alerian MLP Index ETNs due May 24, 2024	AMJ	NYSE Arca, Inc.
Guarantee of Callable Fixed Rate Notes due June 10, 2032 of JPMorgan Chase Financial Company LLC	JPM/32	The New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. Yes No

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

The aggregate market value of JPMorgan Chase & Co. common stock held by non-affiliates as of June 30, 2021: \$461,141,177,226

Number of shares of common stock outstanding as of January 31, 2022: 2,952,808,970

Documents incorporated by reference: Portions of the registrant's Proxy Statement for the annual meeting of stockholders to be held on May 17, 2022, are incorporated by reference in this Form 10-K in response to Items 10, 11, 12, 13 and 14 of Part III.

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Part I

Item 1. Business.

Overview

JPMorgan Chase & Co. (“JPMorgan Chase” or the “Firm”, NYSE: JPM), a financial holding company incorporated under Delaware law in 1968, is a leading financial services firm based in the United States of America (“U.S.”), with operations worldwide. JPMorgan Chase had \$3.7 trillion in assets and \$294.1 billion in stockholders’ equity as of December 31, 2021. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Firm serves millions of customers, predominantly in the U.S., and many of the world’s most prominent corporate, institutional and government clients globally.

JPMorgan Chase’s principal bank subsidiary is JPMorgan Chase Bank, National Association (“JPMorgan Chase Bank, N.A.”), a national banking association with U.S. branches in 48 states and Washington, D.C. as of December 31, 2021. JPMorgan Chase’s principal non-bank subsidiary is J.P. Morgan Securities LLC (“J.P. Morgan Securities”), a U.S. broker-dealer. The bank and non-bank subsidiaries of JPMorgan Chase operate nationally as well as through overseas branches and subsidiaries, representative offices and subsidiary foreign banks. The Firm’s principal operating subsidiary outside the U.S. is J.P. Morgan Securities plc, a U.K.-based subsidiary of JPMorgan Chase Bank, N.A.

The Firm’s website is www.jpmorganchase.com. JPMorgan Chase makes available on its website, free of charge, annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934, as soon as reasonably practicable after it electronically files or furnishes such material to the U.S. Securities and Exchange Commission (the “SEC”) at www.sec.gov. JPMorgan Chase makes new and important information about the Firm available on its website at <https://www.jpmorganchase.com>, including on the Investor Relations section of its website at <https://www.jpmorganchase.com/ir>. Information on the Firm’s website is not incorporated by reference into this 2021 Form 10-K or the Firm’s other filings with the SEC. The Firm has adopted, and posted on its website, a Code of Conduct for all employees of the Firm and a Code of Ethics for its Chairman and Chief Executive Officer, Chief Financial Officer, Principal Accounting Officer and all other professionals of the Firm worldwide serving in a finance, accounting, treasury, tax or investor relations role.

Business segments

For management reporting purposes, JPMorgan Chase’s activities are organized into four major reportable business segments, as well as a Corporate segment. The Firm’s consumer business is the Consumer & Community Banking (“CCB”) segment. The Firm’s wholesale business segments are the Corporate & Investment Bank (“CIB”), Commercial Banking (“CB”), and Asset & Wealth Management (“AWM”).

A description of the Firm’s business segments and the products and services they provide to their respective client bases is provided in the “Business segment results” section of Management’s discussion and analysis of financial condition and results of operations (“Management’s discussion and analysis” or “MD&A”), beginning on page 46 and in Note 32.

Competition

JPMorgan Chase and its subsidiaries and affiliates operate in highly competitive environments. Competitors include other banks, brokerage firms, investment banking companies, merchant banks, hedge funds, commodity trading companies, private equity firms, insurance companies, mutual fund companies, investment managers, credit card companies, mortgage banking companies, trust companies, securities processing companies, automobile financing companies, leasing companies, e-commerce and other internet-based companies, financial technology companies, and other companies engaged in providing similar and new products and services. The Firm’s businesses generally compete on the basis of the quality and variety of the Firm’s products and services, transaction execution, innovation, reputation and price. Competition also varies based on the types of clients, customers, industries and geographies served. With respect to some of its geographies and products, JPMorgan Chase competes globally; with respect to others, the Firm competes on a national or regional basis. New competitors in the financial services industry continue to emerge, including firms that offer products and services solely through the internet and non-financial companies that offer payment or loan products.

Part I

Human capital

JPMorgan Chase believes that its long-term growth and success depend on its ability to attract, develop and retain a high-performing and diverse workforce, with inclusion and accessibility as key components of the way the Firm does business. The information provided below relates to JPMorgan Chase’s full-time and part-time employees and does not include the Firm’s contractors.

Global workforce

As of December 31, 2021, JPMorgan Chase had 271,025 employees globally, an increase of 15,674 employees from the prior year. The Firm’s employees are located in 62 countries, with over 60% of the Firm’s employees located in the U.S. The following table presents the distribution of the Firm’s global workforce by region and by LOB and Corporate as of December 31, 2021:

Employee Breakdown by Region		Employee Breakdown by LOB and Corporate	
Region	Employees	LOB	Employees
North America	169,090	CCB	128,863
Europe/Middle East/Africa	24,260	CIB	67,546
Latin America/Caribbean	4,140	CB	12,902
Asia-Pacific	73,535	AWM	22,762
Total Firm	271,025	Corporate	38,952
		Total Firm	271,025

Diversity, equity and inclusion

In connection with its diversity initiatives, the Firm periodically requests that its employees and Board members self-identify based on specified diversity categories. The following table presents information on self-identifications as of December 31, 2021. The information according to Equal Employment Opportunity (“EEO”) race/ethnicity categories and gender is based on U.S. and global employees, respectively, who self-identified. Race/ethnicity and gender information reflects all members of the Operating Committee and the Board of Directors. Information on LGBT+ and veteran statuses is based on U.S. employees, and all members of the Operating Committee and the Board of Directors. Information on disability status is based on all U.S. employees and all members of the Operating Committee.

December 31, 2021	Total employees	Senior level employees ^(e)	Operating Committee	Board of Directors
Race/Ethnicity ^(a) :				
White	46%	77%	84%	90%
Hispanic	20%	6%	11%	–
Asian	17%	11%	5%	–
Black	14%	5%	–	10%
Other ^(b)	3%	1%	–	–
Gender ^(c) :				
Men	51%	74%	63%	60%
Women	49%	26%	37%	40%
LGBT+ ^(d)				
Military veterans ^(d)	3%	2%	–	–
People with disabilities ^(d)	4%	2%	–	– ^(f)

(a) Based on EEO metrics. Presented as a percentage of the respective populations who self-identified race/ethnicity: 96% and 95% of the Firm’s total U.S.-based employees and U.S.-based senior level employees, respectively, and all members of the Operating Committee and the Board of Directors. Information for the Operating Committee includes two members who are based outside of the U.S.

(b) Other includes American Indian or Alaskan Native, Native Hawaiian or Other Pacific Islander, and two or more races/ethnicities.

(c) Presented as a percentage of the respective populations who self-identified gender: 99% of each of the Firm’s total global employees and global senior level employees, and all members of the Operating Committee and the Board of Directors.

(d) Presented as a percentage of total U.S.-based employees, total U.S.-based senior level employees, all members of the Operating Committee, and all members of the Board of Directors, respectively.

(e) Senior level employees represents employees with the titles of Managing Director and above.

(f) The Firm did not request members of the Board of Directors to self-identify disability status.

Firm culture

The foundations of JPMorgan Chase's culture are its core values and How We Do Business Principles, which are fundamental to the Firm's success and are represented by four central corporate tenets: exceptional client service; operational excellence; a commitment to integrity, fairness and responsibility; and cultivation of a great team and winning culture. The Firm maintains its focus on its culture of inclusion and respect, which is reinforced by its Code of Conduct and through increasing employee awareness and education, communication and training. An important part of these efforts includes the Firm's Business Resource Groups, which are groups of employees who support JPMorgan Chase's diversity, equity and inclusion strategies by leveraging the unique perspectives of their members. The Firm has global Diversity, Equity & Inclusion centers of excellence, several of which were launched in 2021, that lead the Firm's strategy in supporting its commitments to create more equity and lasting impact in communities, and strengthen its inclusive culture.

Attracting and retaining employees

The goal of JPMorgan Chase's recruitment efforts is to attract and hire talented individuals in all roles and at all career levels. The Firm strives to provide both external candidates and internal employees who are seeking a different role with challenging and stimulating career opportunities. These opportunities range from internship training programs for students to entry-level, management and executive careers. During 2021, approximately two thirds of the Firm's employment opportunities were filled by external candidates, with the remainder filled by existing employees.

Diversity is an important area of focus throughout the Firm's hiring process. JPMorgan Chase engages in efforts aimed at hiring diverse talent, including initiatives focused on gender, underrepresented ethnic groups, LGBT+ individuals, people with disabilities, veterans and others. The Firm's global Diversity, Equity & Inclusion centers of excellence seek to increase representation of and advance career opportunities for talented diverse individuals across the Firm through initiatives such as career coaching and mentorship.

JPMorgan Chase offers a competitive fellowship program that seeks to attract accomplished individuals who have taken a career break and wish to return to the workforce. In addition, where appropriate, the Firm's hiring practices focus on the skills of a job candidate rather than degrees held.

Developing employees

JPMorgan Chase supports the professional development and career growth of its employees. An onboarding training curriculum is required for new hires, which covers Code of Conduct, compliance and cybersecurity, among other topics. In addition, the Firm offers extensive training programs to all employees, covering a broad variety of topics such as leadership, change management, analytical thinking, culture and conduct, diversity, equity and inclusion, and risk and controls. Leadership Edge, the Firm's global leadership development Center of Excellence, is focused on creating one Firm leadership culture.

Compensation and benefits

The Firm provides market-competitive compensation and benefits programs. JPMorgan Chase's compensation philosophy provides the guiding principles that drive compensation-related decisions across the Firm, including pay-for-performance, responsiveness and alignment with shareholder interests, reinforcement of the Firm's culture and How We Do Business Principles, and integration of risk, controls and conduct considerations. The Firm's commitment to diversity, equity and inclusion for all employees includes compensation review processes that seek to ensure that the Firm's employees are paid equitably and competitively for the work they do.

The Firm also supports employees' well-being. JPMorgan Chase offers an extensive benefits and wellness package to employees and their families, including healthcare coverage, retirement benefits, life and disability insurance, on-site health and wellness centers, employee assistance programs, competitive vacation and leave policies, backup child care arrangements, tuition reimbursement programs, mental health counseling and support, and financial coaching. The Firm has taken action to protect and support its employees during the COVID-19 pandemic, including continued implementation of health and safety protocols, and providing additional benefits. For more information on the Firm's response to the COVID-19 pandemic, refer to Business Developments on page 50.

Part I

Supervision and regulation

The Firm is subject to extensive and comprehensive regulation under U.S. federal and state laws, as well as the applicable laws of the jurisdictions outside the U.S. in which the Firm does business.

Financial holding company:

Consolidated supervision. JPMorgan Chase & Co. is a bank holding company (“BHC”) and a financial holding company (“FHC”) under U.S. federal law, and is subject to comprehensive consolidated supervision, regulation and examination by the Board of Governors of the Federal Reserve System (the “Federal Reserve”). The Federal Reserve acts as the supervisor of the consolidated operations of BHCs. Certain of JPMorgan Chase’s subsidiaries are also regulated directly by additional authorities based on the activities or licenses of those subsidiaries.

JPMorgan Chase’s national bank subsidiary, JPMorgan Chase Bank, N.A., is supervised and regulated by the Office of the Comptroller of the Currency (“OCC”) and, with respect to certain matters, by the Federal Deposit Insurance Corporation (the “FDIC”).

JPMorgan Chase’s U.S. broker-dealers are supervised and regulated by the Securities and Exchange Commission (“SEC”) and the Financial Industry Regulatory Authority (“FINRA”). Subsidiaries of the Firm that engage in certain futures-related and swaps-related activities are supervised and regulated by the Commodity Futures Trading Commission (“CFTC”). J.P. Morgan Securities plc is a U.K.-based bank regulated by the U.K. Prudential Regulation Authority (the “PRA”) and the U.K. Financial Conduct Authority (“FCA”).

The Firm’s other non-U.S. subsidiaries are regulated by the banking, securities, prudential and conduct regulatory authorities in the countries in which they operate.

Permissible business activities. The Bank Holding Company Act restricts BHCs from engaging in business activities other than the business of banking and certain closely-related activities. FHCs can engage in a broader range of financial activities. The Federal Reserve has the authority to limit an FHC’s ability to conduct otherwise permissible activities if the FHC or any of its depository institution subsidiaries ceases to meet applicable eligibility requirements. The Federal Reserve may also impose corrective capital and/or managerial requirements on the FHC, and if deficiencies are persistent, may require divestiture of the FHC’s depository institutions. If any depository institution controlled by an FHC fails to maintain a satisfactory rating under the Community Reinvestment Act, the Federal Reserve must prohibit the FHC and its subsidiaries from engaging in any new activities other than those permissible for BHCs, or acquiring a company engaged in such activities.

Capital and liquidity requirements. The Federal Reserve establishes capital, liquidity and leverage requirements for JPMorgan Chase that are generally consistent with the

international Basel III capital and liquidity framework and evaluates the Firm’s compliance with those requirements. The OCC establishes similar requirements for JPMorgan Chase Bank, N.A. Certain of the Firm’s non-U.S. subsidiaries and branches are also subject to local capital and liquidity requirements.

Banking supervisors globally continue to refine and enhance the Basel III capital framework for financial institutions. In January 2019, the Basel Committee issued “Minimum capital requirements for market risk.” The Basel Committee expects national regulators to implement these revised market risk requirements for banking organizations in their jurisdictions by January 2023, in line with the other elements of the Basel III Reforms. U.S. banking regulators have announced their support for the issuance of the Basel III Reforms and are considering how to appropriately apply such reforms in the U.S.

Refer to Capital Risk Management on pages 86-96 and Liquidity Risk Management on pages 97-104 .

Stress tests. As a large BHC, JPMorgan Chase is subject to supervisory stress testing administered by the Federal Reserve as part of the Federal Reserve’s annual Comprehensive Capital Analysis and Review (“CCAR”) framework. The Firm must conduct annual company-run stress tests and must also submit an annual capital plan to the Federal Reserve, taking into account the results of separate stress tests designed by the Firm and the Federal Reserve. The Federal Reserve uses the results under the severely adverse scenario from its supervisory stress test to determine the Firm’s Stress Capital Buffer (“SCB”) requirement for the coming year, which forms part of the Firm’s applicable capital buffers. The Firm is required to file its annual CCAR submission on April 5, 2022. The Federal Reserve will notify the Firm of its indicative SCB requirement by June 30, 2022 and final SCB requirement by August 31, 2022. The Firm’s final SCB requirement will become effective on October 1, 2022. The OCC requires JPMorgan Chase Bank, N.A. to perform separate, similar stress tests annually. The Firm publishes each year the results of the annual stress tests for the Firm and JPMorgan Chase Bank, N.A. under the supervisory “severely adverse” scenarios provided by the Federal Reserve and the OCC. Refer to Capital Risk Management on pages 86-96 for more information concerning the Firm’s CCAR.

Enhanced prudential standards. As part of its mandate to identify and monitor risks to the financial stability of the U.S. posed by large banking organizations, the Financial Stability Oversight Council (“FSOC”) recommends prudential standards and reporting requirements to the Federal Reserve for systemically important financial institutions (“SIFIs”), such as JPMorgan Chase. The Federal Reserve has adopted several rules to implement those heightened prudential standards, including rules relating to risk management and corporate governance of subject BHCs. JPMorgan Chase is required under these rules to comply with enhanced liquidity and overall risk

management standards, including oversight by the board of directors of risk management activities.

Resolution and recovery. The Firm is required to maintain a comprehensive recovery plan, updated annually, summarizing the actions it would take to avoid failure by remaining well-capitalized and well-funded in the case of an adverse event. In addition, JPMorgan Chase Bank, N.A. is required to prepare and submit a recovery plan as directed by the OCC. The Firm is required to submit periodically to the Federal Reserve and the FDIC a plan for resolution in the event of material distress or failure (a “resolution plan”). In 2019, the FDIC and Federal Reserve revised the regulations governing resolution plan requirements, and on the basis of those revisions, the Firm’s resolution plan submissions will alternate between “targeted” and “full” plans. The Firm’s “targeted” resolution plan was filed on June 28, 2021. JPMorgan Chase Bank, N.A. is also required to prepare and submit a separate resolution plan as directed by the FDIC.

Certain of the Firm’s non-U.S. subsidiaries and branches are also subject to local resolution and recovery planning requirements.

Orderly liquidation authority. Certain financial companies, including JPMorgan Chase and certain of its subsidiaries, can also be subjected to resolution under an “orderly liquidation authority.” The U.S. Treasury Secretary, in consultation with the President of the United States, must first make certain determinations concerning extraordinary financial distress and systemic risk, and action must be recommended by the FDIC and the Federal Reserve. Absent such actions, the Firm, as a BHC, would remain subject to resolution under the Bankruptcy Code. The FDIC has issued a draft policy statement describing its “single point of entry” strategy for resolution of SIFIs under the orderly liquidation authority, which seeks to keep operating subsidiaries of a BHC open and impose losses on shareholders and creditors of the BHC in receivership according to their statutory order of priority.

Holding company as a source of strength. JPMorgan Chase & Co. is required to serve as a source of financial strength for its depository institution subsidiaries and to commit resources to support those subsidiaries, including when directed to do so by the Federal Reserve.

Regulation of acquisitions. Acquisitions by BHCs and their banks are subject to requirements, limitations and prohibitions established by law and by the Federal Reserve and the OCC. For example, FHCs and BHCs are required to obtain the approval of the Federal Reserve before they acquire more than 5% of the voting shares of an unaffiliated bank. In addition, acquisitions by financial companies are prohibited if, as a result of the acquisition, the total liabilities of the financial company would exceed 10% of the total liabilities of all financial companies. Furthermore, for certain acquisitions, the Firm must provide written notice to the Federal Reserve prior to acquiring direct or indirect ownership or control of any

voting shares of any company with over \$10 billion in assets that is engaged in activities that are “financial in nature.”

Ongoing obligations. The Firm is subject to obligations under the terms of a Deferred Prosecution Agreement entered into with the Department of Justice on September 29, 2020 relating to precious metals and U.S. Treasuries markets investigations as well as under a related order issued by the CFTC.

Subsidiary banks:

The activities of JPMorgan Chase Bank, N.A., the Firm’s principal subsidiary bank, are limited to those specifically authorized under the National Bank Act and related interpretations of the OCC. The OCC has authority to bring an enforcement action against JPMorgan Chase Bank, N.A. for unsafe or unsound banking practices, which could include limiting JPMorgan Chase Bank, N.A.’s ability to conduct otherwise permissible activities, or imposing corrective capital or managerial requirements on the bank.

FDIC deposit insurance. The FDIC deposit insurance fund provides insurance coverage for certain deposits and is funded through assessments on banks, such as JPMorgan Chase Bank, N.A.

FDIC powers upon a bank insolvency. Upon the insolvency of JPMorgan Chase Bank, N.A., the FDIC could be appointed as conservator or receiver under the Federal Deposit Insurance Act. The FDIC has broad powers to transfer assets and liabilities without the approval of the institution’s creditors.

Prompt corrective action. The Federal Deposit Insurance Corporation Improvement Act of 1991 requires the relevant federal banking regulator to take “prompt corrective action” with respect to a depository institution if that institution does not meet certain capital adequacy standards. The Federal Reserve is also authorized to take appropriate action against the parent BHC, such as JPMorgan Chase & Co., based on the undercapitalized status of any bank subsidiary. In certain instances, the BHC would be required to guarantee the performance of the capital restoration plan for its undercapitalized subsidiary.

OCC Heightened Standards. The OCC has established guidelines setting forth heightened standards for large banks, including minimum standards for the design and implementation of a risk governance framework for banks. Under these standards, a bank’s risk governance framework must ensure that the bank’s risk profile is easily distinguished and separate from that of its parent BHC for risk management purposes. The bank’s board or risk committee is responsible for approving the bank’s risk governance framework, providing active oversight of the bank’s risk-taking activities, and holding management accountable for adhering to the risk governance framework.

Restrictions on transactions with affiliates. JPMorgan Chase Bank, N.A. and its subsidiaries are subject to restrictions imposed by federal law on extensions of credit to,

Part I

investments in stock or securities of, and derivatives, securities lending and certain other transactions with, JPMorgan Chase & Co. and certain other affiliates. These restrictions prevent JPMorgan Chase & Co. and other affiliates from borrowing from such subsidiaries unless the loans are secured in specified amounts and comply with certain other requirements.

Dividend restrictions. Federal law imposes limitations on the payment of dividends by national banks, such as JPMorgan Chase Bank, N.A. Refer to Note 26 for the amount of dividends that JPMorgan Chase Bank, N.A. could pay, at January 1, 2022, to JPMorgan Chase without the approval of the banking regulators. The OCC and the Federal Reserve also have authority to prohibit or limit the payment of dividends of a bank subsidiary that they supervise if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the bank.

Depositor preference. Under federal law, the claims of a receiver of an IDI for administrative expense and the claims of holders of U.S. deposit liabilities (including the FDIC and deposits in non-U.S. branches that are dually payable in the U.S. and in a non-U.S. branch) have priority over the claims of other unsecured creditors of the institution, including depositors in non-U.S. branches and public noteholders.

Consumer supervision and regulation. JPMorgan Chase and JPMorgan Chase Bank, N.A. are subject to supervision and regulation by the Consumer Financial Protection Bureau ("CFPB") with respect to federal consumer protection laws, including laws relating to fair lending and the prohibition of unfair, deceptive or abusive acts or practices in connection with the offer, sale or provision of consumer financial products and services. The CFPB also has jurisdiction over small business lending activities with respect to fair lending and the Equal Credit Opportunity Act. As part of its regulatory oversight, the CFPB has authority to take enforcement actions against firms that offer certain products and services to consumers using practices that are deemed to be unfair, deceptive or abusive. The Firm's consumer activities are also subject to regulation under state statutes which are enforced by the Attorney General or empowered agency of each state.

In September 2021, the Firm launched a retail bank in the U.K. operating through J.P. Morgan Europe Limited ("JPMEU") and acquired Nutmeg Saving and Investment Limited, a U.K. online digital investment manager ("Nutmeg"). JPMEU is regulated by the PRA, and both JPMEU and Nutmeg are regulated by the FCA with respect to their conduct of financial services in the U.K., including obligations relating to the fair treatment of customers. JPMEU is also regulated by the U.K. Payment Systems Regulator with respect to its operation and use of payment systems. In addition, the retail businesses of JPMEU and Nutmeg are subject to U.K. consumer-protection legislation.

Securities and broker-dealer regulation:

The Firm conducts securities underwriting, dealing and brokerage activities in the U.S. through J.P. Morgan Securities LLC and other non-bank broker-dealer subsidiaries, all of which are subject to regulations of the SEC, FINRA and the New York Stock Exchange, among others. The Firm conducts similar securities activities outside the U.S. subject to local regulatory requirements. In the U.K., those activities are conducted by J.P. Morgan Securities plc. Broker-dealers are subject to laws and regulations covering all aspects of the securities business, including sales and trading practices, securities offerings, publication of research reports, use of customer funds, the financing of client purchases, capital structure, record-keeping and retention, and the conduct of their directors, officers and employees. Refer to Broker-dealer regulatory capital on page 96 for information concerning the capital of J.P. Morgan Securities LLC and J.P. Morgan Securities plc.

Investment management regulation:

The Firm's asset and wealth management businesses are subject to significant regulation in jurisdictions around the world relating to, among other things, the safeguarding and management of client assets, offerings of funds and marketing activities. Certain of the Firm's subsidiaries are registered with, and subject to oversight by, the SEC as investment advisers and broker-dealers. The Firm's registered investment advisers are subject to the fiduciary and other obligations imposed under the Investment Advisers Act of 1940, as well as various state securities laws. The Firm's bank fiduciary activities are subject to supervision by the OCC.

Derivatives regulation:

The Firm is subject to comprehensive regulation of its derivatives businesses, including regulations that impose capital and margin requirements, require central clearing of standardized over-the-counter ("OTC") derivatives, mandate that certain standardized OTC swaps be traded on regulated trading venues, and provide for reporting of certain mandated information. JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and J.P. Morgan Securities plc are registered with the CFTC as "swap dealers". In addition, JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC registered with the SEC as "security-based swap dealers" effective November 2021. As a result, these entities are subject to a comprehensive regulatory framework applicable to their swap or security-based swap activities, including capital requirements, rules requiring the collateralization of uncleared swaps and security-based swaps, rules regarding segregation of counterparty collateral, business conduct and documentation standards, record-keeping and reporting obligations, and anti-fraud and anti-manipulation requirements. Similar requirements have also been established under the European Market Infrastructure Regulation ("EMIR") and MiFID II, as implemented in the EU and as adopted in the U.K.

J.P. Morgan Securities LLC is also registered with the CFTC as a futures commission merchant and is a member of the National Futures Association.

Data, privacy and security regulation:

The Firm and its subsidiaries are subject to numerous U.S. federal, state and local as well as international laws, rules and regulations concerning data that are central to the Firm's businesses, functions and operations. These include laws, rules and regulations relating to data protection, privacy, data use, confidentiality, secrecy, cybersecurity, technology, artificial intelligence, data localization and storage, data retention and destruction, disclosure, transfer, availability, integrity and other similar matters. Numerous jurisdictions have passed laws, rules and regulations in these areas and many are considering new or updated ones that could affect the Firm's businesses. Many of these laws apply not only to the Firm's transactions with third parties but also to interactions between and among the Firm's own affiliates and subsidiaries. The application, interpretation and enforcement of these laws, rules and regulations are often uncertain, particularly in light of new and rapidly evolving data-driven technologies and significant increase in computing power. These laws, rules and regulations are constantly evolving, remain a focus of regulators globally, may be enforced by private parties or government bodies, and will continue to have a significant impact on all of the Firm's businesses and operations.

The Bank Secrecy Act and Economic Sanctions:

The Bank Secrecy Act ("BSA") requires all financial institutions, including banks and securities broker-dealers, to establish a risk-based system of internal controls reasonably designed to prevent money laundering and the financing of terrorism. The BSA includes a variety of record-keeping and reporting requirements, as well as due diligence/know-your-customer documentation requirements. The Firm is also subject to the regulations and economic sanctions programs administered by the U.S. Treasury's Office of Foreign Assets Control ("OFAC"). In addition, the EU and the U.K. have adopted various economic sanctions programs targeted at entities or individuals that are, or are located in countries that are, involved in terrorism, hostilities, embezzlement or human rights violations. The Firm is also subject to economic sanctions laws, rules and regulations in other jurisdictions in which it operates, including those that conflict with or prohibit a firm such as JPMorgan Chase from complying with certain laws, rules and regulations to which it is otherwise subject.

Anti-Corruption:

The Firm is subject to laws and regulations relating to corrupt and illegal payments to government officials and others in the jurisdictions in which it operates, including the U.S. Foreign Corrupt Practices Act and the U.K. Bribery Act.

Compensation practices:

The Firm's compensation practices are subject to oversight by the Federal Reserve, as well as other agencies. The

Federal Reserve has jointly issued guidance with the FDIC and the OCC that is designed to ensure that incentive compensation paid by banking organizations does not encourage imprudent risk-taking that threatens the organizations' safety and soundness. The Financial Stability Board ("FSB") has also established standards covering compensation principles for banks. The Firm's compensation practices are also subject to regulation and oversight by regulators in other jurisdictions, notably the Fifth Capital Requirements Directive ("CRD V"), as implemented in the EU and as adopted in the U.K, which includes compensation-related provisions. The European Banking Authority has instituted guidelines on compensation policies including under CRD V which in certain countries, such as Germany, are implemented or supplemented by local regulations or guidelines. The U.K. regulators have also instituted guidelines on CRD V compensation policies. The Firm expects that the implementation of regulatory guidelines regarding compensation in the U.S. and other countries will continue to evolve, and may affect the manner in which the Firm structures its compensation programs and practices.

Other significant international regulatory initiatives:

Policymakers in the U.K. and EU continue to implement an extensive program of regulatory enhancements relating to financial services, several key elements of which are discussed below.

U.K. and EU policymakers have recently proposed changes to the Markets in Financial Instruments Directive ("MiFID II"). MiFID II, which requires the trading of shares and certain standardized OTC derivatives to take place on trading venues and also significantly enhanced requirements for pre- and post-trade transparency, transaction reporting and investor protection, and introduced a position limits and reporting regime for commodities. In November 2021, the European Commission published a draft legislative proposal for amendments to MiFID II focused on changes to the transparency and market structure rules, including the proposed creation of a consolidated tape intended to provide investors with a holistic view of trading across the EU. This legislation is subject to review by the European Parliament and Council.

In the U.K., Her Majesty's Treasury ("HMT") and the FCA have undertaken a review of MiFID II, as adopted in the U.K. In July 2021, HMT published its 'Wholesale Markets Review' consultation, which proposed a broad range of changes covering most parts of the MiFID II legislation. HMT is expected to release its related policy statement in the first quarter of 2022. Detailed consultations with specific rule proposals relating to the HMT policy statement are expected from the FCA during 2022.

In November 2021, EU legislators agreed to delay implementation of the mandatory buy-in rules required under the Central Securities Depositories Regulation ("CSDR"), which were previously scheduled to become effective on February 1, 2022. In the interim, the European Securities and Markets Authority published a letter

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directing EU competent authorities to not prioritize supervisory action against firms under the CSDR. The U.K. previously announced in July 2020 that it would not be adopting the CSDR settlement discipline regime, which includes both the buy-in regime and the penalty regime.

The U.K. and EU have also proposed various reforms for the derivatives market, including proposed amendments to clearing obligations (“CO”) under the European Markets and Infrastructure Regulation and to derivatives trading obligations (“DTO”) under the Markets in Financial Instruments Regulation, including issuing final rules to change the CO and DTO to reflect industry transition away from IBORs to risk-free reference rates.

The finalized Basel III capital and liquidity standards for banks and investment firms, including in relation to the leverage ratio, counterparty credit risk capital, large exposures and the net stable funding ratio, have been implemented through legislation that became effective in the EU in June 2021 and in the U.K. on January 1, 2022. The Firm’s banking entities in the U.K. and EU will also be required to comply with certain changes made by the Basel Committee to the Basel III framework, including revisions to the credit risk and operational risk calculation methods, when they are implemented in those jurisdictions. EU legislation also requires that certain non-EU banks operating in the EU establish an intermediate parent undertaking (“IPU”) located in the EU. The IPU legislation allows a second IPU to be established if a single IPU would conflict with “home country” bank separation rules or impede resolvability. The Firm will be required to comply with the EU’s IPU requirements, to the extent applicable, by December 30, 2023.

The Firm’s banking entities in the U.K. and EU are subject to supervisory expectations published by the PRA and European Central Bank (“ECB”), respectively, for management of financial risks arising from climate change. These supervisory expectations address bank strategy, governance, risk management, scenario analysis, risk reporting and disclosure.

Item 1A. Risk Factors.

The following discussion sets forth the material risk factors that could affect JPMorgan Chase's financial condition and operations. Readers should not consider any descriptions of these factors to be a complete set of all potential risks that could affect the Firm. Any of the risk factors discussed below could by itself, or combined with other factors, materially and adversely affect JPMorgan Chase's business, results of operations, financial condition, capital position, liquidity, competitive position or reputation, including by materially increasing expenses or decreasing revenues, which could result in material losses or a decrease in earnings.

Summary

The principal risk factors that could adversely affect JPMorgan Chase's business, results of operations, financial condition, capital position, liquidity, competitive position or reputation include:

- Risks related to the **COVID-19 pandemic**, including the ongoing effects of the pandemic which could harm the global economy and negatively affect JPMorgan Chase's businesses.
- **Regulatory** risks, including the impact that applicable laws, rules and regulations in the highly-regulated financial services industry, as well as changes to or in the application, interpretation or enforcement of those laws, rules and regulations, can have on JPMorgan Chase's business and operations; the ways in which differences in financial services regulation in different jurisdictions or with respect to certain competitors can disadvantage JPMorgan Chase's business; the penalties and collateral consequences, and higher compliance and operational costs, that JPMorgan Chase may incur when resolving a regulatory investigation; risks associated with complying with anti-money laundering, economic sanctions and anti-corruption laws; the ways in which less predictable legal and regulatory frameworks in certain countries can negatively impact JPMorgan Chase's operations and financial results; and the losses that security holders will absorb if JPMorgan Chase were to enter into a resolution.
- **Political** risks, including the potential negative effects on JPMorgan Chase's businesses due to economic uncertainty or instability caused by political developments.
- **Market** risks, including the effects that economic and market events and conditions, governmental policies, changes in interest rates and credit spreads, and market fluctuations can have on JPMorgan Chase's consumer and wholesale businesses and its investment and market-making positions.
- **Credit** risks, including potential negative effects from adverse changes in the financial condition of clients, customers, counterparties, custodians and central counterparties; and the potential for losses due to declines in the value of collateral in stressed market conditions or from concentrations of credit and market risk.
- **Liquidity** risks, including the risk that JPMorgan Chase's liquidity could be impaired by market-wide illiquidity or disruption, unforeseen liquidity or capital requirements, the inability to sell assets, default by a significant market participant, unanticipated outflows of cash or collateral, or lack of market or customer confidence in JPMorgan Chase; the dependence of JPMorgan Chase & Co. on the cash flows of its subsidiaries; the adverse effects that any downgrade in any of JPMorgan Chase's credit ratings may have on its liquidity and cost of funding; and potential negative impacts on JPMorgan Chase's funding, investments and financial products, as well as litigation risks, associated with the transition from U.S. dollar LIBOR and other benchmark rates.
- **Capital** risks, including the risk that any failure by or inability of JPMorgan Chase to maintain the required level and composition of capital, or unfavorable changes in applicable capital requirements, could limit JPMorgan Chase's ability to distribute capital to shareholders or to support its business activities.
- **Operational** risks, including risks associated with JPMorgan Chase's dependence on its operational systems and the competence, integrity, health and safety of its employees, as well as the systems and employees of third parties and service providers; the potential negative effects of failing to identify and address operational risks related to the introduction of or changes to products, services and delivery platforms; risks from JPMorgan Chase's exposure to operational systems of third parties; legal and regulatory risks related to safeguarding personal information; the harm that could be caused by a successful cyber attack affecting JPMorgan Chase or by other extraordinary events; risks associated with JPMorgan Chase's risk management framework, its models and estimations and associated judgments used in its stress testing and financial statements, and controls over disclosure and financial reporting; and potential adverse effects of failing to comply with heightened regulatory and other standards for the oversight of vendors and other service providers.
- **Strategic** risks, including the damage to JPMorgan Chase's competitive standing and results that could occur if management fails to develop and execute effective business strategies; risks associated with the significant and increasing competition that JPMorgan Chase faces; and the potential adverse impacts of climate change on JPMorgan Chase's business operations, clients and customers.
- **Conduct** risks, including the negative impact that can result from the failure of employees to conduct themselves in accordance with JPMorgan Chase's expectations, policies and practices.

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- **Reputation** risks, including the potential adverse effects on JPMorgan Chase's relationships with its clients, customers, shareholders, regulators and other stakeholders that could arise from employee misconduct, security breaches, inadequate risk management, compliance or operational failures, litigation and regulatory investigations, failure to satisfy expectations concerning social and environmental concerns, failure to effectively manage conflicts of interest or to satisfy fiduciary obligations, or other factors that could damage JPMorgan Chase's reputation.
- **Country** risks, including potential impacts on JPMorgan Chase's businesses from an outbreak or escalation of hostilities between countries or within a country or region; and the potential adverse effects of local economic, political, regulatory and social factors on JPMorgan Chase's business and revenues in certain countries.
- **People** risks, including the criticality of attracting and retaining qualified and diverse employees; and the potential adverse effects of unfavorable changes in immigration or travel policies on JPMorgan Chase's workforce.
- **Legal** risks relating to litigation and regulatory and government investigations.

The above summary is subject in its entirety to the discussion of the risk factors set forth below.

COVID-19 Pandemic

Ongoing effects of the COVID-19 pandemic could harm the global economy and negatively affect JPMorgan Chase's businesses.

On March 11, 2020, the World Health Organization declared the outbreak of a strain of novel coronavirus disease, COVID-19, to be a global pandemic. The COVID-19 pandemic and governmental responses to the pandemic, which included the institution of social distancing and shelter-in-place requirements in certain areas of the U.S. and other countries, resulted in adverse impacts on global economic conditions, including:

- significant disruption and volatility in the financial markets
- significant disruption of global supply chains, and
- closures of many businesses, leading to loss of revenues and increased unemployment.

The adverse economic conditions caused by the pandemic have had a negative impact on certain of JPMorgan Chase's businesses and results of operations, including:

- reduction in demand for certain products and services from JPMorgan Chase's clients and customers, resulting in lower revenue, and

- increases in the allowance for credit losses during the early stages of the pandemic.

Although global economic conditions have been improving despite the continuation of the COVID-19 pandemic, any ongoing negative economic impacts arising from the pandemic or any prolongation or worsening of the pandemic, including as a result of additional waves or variants of the COVID-19 disease or the emergence of other diseases that have similar outcomes, could have significant adverse effects on JPMorgan Chase's businesses, results of operations and financial condition, including:

- recognition of charge-offs and increases in the allowance for credit losses, including any delayed recognition of charge-offs due to the impact of government stimulus actions or payment assistance provided to clients and customers
- material impacts on the value of securities, derivatives and other financial instruments which JPMorgan Chase owns or in which it makes markets
- downgrades in JPMorgan Chase's credit ratings
- constraints on liquidity or capital due to elevated levels of deposits, increases in risk-weighted assets ("RWA") related to supporting client activities, downgrades in client credit ratings, regulatory actions or other factors, any or all of which could require JPMorgan Chase to take or refrain from taking actions that it otherwise would under its liquidity and capital management strategies, and
- the possibility that significant portions of JPMorgan Chase's workforce are unable to work effectively, including because of illness, quarantines, shelter-in-place arrangements, government actions or other restrictions in connection with the pandemic.

The extent to which the COVID-19 pandemic negatively affects JPMorgan Chase's businesses, results of operations and financial condition, as well as its regulatory capital and liquidity ratios, will depend on future developments that are uncertain and cannot be fully predicted, including:

- the ultimate scope and duration of the pandemic
- the effectiveness and acceptance of vaccines, and their availability in certain regions
- actions taken by governmental authorities and other third parties in response to the pandemic, and
- the effect that the pandemic or any prolongation or worsening of the pandemic may have on the pace of economic growth, inflation, the strength of labor markets, particularly in light of the expiration of government assistance programs, and the potential for changes in consumer

behavior that could have longer-term impacts on certain economic sectors.

In addition, JPMorgan Chase's participation in U.S. government programs designed to support individuals, households and businesses impacted by the economic disruptions caused by the COVID-19 pandemic, whether directly or indirectly, including on behalf of customers and clients or by affiliated entities, newly-acquired businesses or companies in which JPMorgan Chase has made principal investments, could be criticized and subject JPMorgan Chase to:

- increased governmental and regulatory scrutiny
- negative publicity, and
- increased exposure to litigation,

any or all of which could increase JPMorgan Chase's operational, legal and compliance costs and damage its reputation. To the extent that the COVID-19 pandemic adversely affects JPMorgan Chase's business, results of operations and financial condition, it may also have the effect of heightening many of the other risks described below.

Regulatory

JPMorgan Chase's businesses are highly regulated, and the laws, rules and regulations that apply to JPMorgan Chase have a significant impact on its business and operations.

JPMorgan Chase is a financial services firm with operations worldwide. JPMorgan Chase must comply with the laws, rules and regulations that apply to its operations in all of the jurisdictions around the world in which it does business. Regulation of the financial services industry is extensive.

The regulation and supervision of financial services firms has expanded significantly over an extended period of time. The increased regulation and supervision of JPMorgan Chase has affected the way that it conducts its business and structures its operations. JPMorgan Chase could be required to make further changes to its business and operations in response to expanded supervision or to new or changed laws, rules and regulations. These types of developments could result in JPMorgan Chase incurring additional costs in connection with complying with applicable laws, rules and regulations, which could reduce its profitability. Furthermore, JPMorgan Chase's entry into or acquisition of a new business or an increase in its principal investments may require JPMorgan Chase to comply with additional laws, rules, and regulations.

In response to new and existing laws, rules and regulations and expanded supervision, JPMorgan Chase has in the past been and could in the future be, required to:

- limit the products and services that it offers
- reduce the liquidity that it can provide through its market-making activities

- refrain from engaging in business opportunities that it might otherwise pursue
- pay higher taxes, assessments, levies or other governmental charges, including in connection with the resolution of tax examinations
- incur losses with respect to fraudulent transactions perpetrated against its customers
- dispose of certain assets, and do so at times or prices that are disadvantageous
- impose restrictions on certain business activities, or
- increase the prices that it charges for products and services, which could reduce the demand for them.

In particular, JPMorgan Chase's businesses and results of operations could be adversely impacted by changes in laws, rules and regulations, or changes in the application, interpretation or enforcement of laws, rules and regulations, that:

- proscribe or institute more stringent restrictions on certain financial services activities
- impose new requirements relating to the impact of business activities on environmental, social and governance ("ESG") concerns, the management of risks associated with those concerns and the offering of products intended to achieve ESG-related objectives, or
- introduce changes to antitrust or anti-competition laws, rules and regulations that adversely affect the business activities of JPMorgan Chase.

Differences in financial services regulation can be disadvantageous for JPMorgan Chase's businesses.

The content and application of laws, rules and regulations affecting financial services firms sometimes vary according to factors such as the size of the firm, the jurisdiction in which it is organized or operates, and other criteria. For example:

- larger firms such as JPMorgan Chase are often subject to more stringent supervision and regulation
- financial technology companies and other non-traditional competitors may not be subject to banking regulation, or may be supervised by a national or state regulatory agency that does not have the same resources or regulatory priorities as the regulatory agencies which supervise more diversified financial services firms, or
- the financial services regulatory framework in a particular jurisdiction may favor financial institutions that are based in that jurisdiction.

These types of differences in the regulatory framework can result in JPMorgan Chase losing market share to competitors that are less regulated or not subject to regulation, especially with respect to unregulated financial products.

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There can also be significant differences in the ways that similar regulatory initiatives affecting the financial services industry are implemented in the U.S. and in other countries and regions in which JPMorgan Chase does business. For example, when adopting rules that are intended to implement a global regulatory standard, a national regulator may introduce additional or more restrictive requirements, which can create competitive disadvantages for financial services firms, such as JPMorgan Chase, that may be subject to those enhanced regulations.

Legislative and regulatory initiatives outside the U.S. could require JPMorgan Chase to make significant modifications to its operations and legal entity structure in the relevant countries or regions in order to comply with those requirements. These include laws, rules and regulations that have been adopted or proposed relating to:

- the establishment of locally-based intermediate holding companies or operating subsidiaries
- requirements to maintain minimum amounts of capital or liquidity in locally-based subsidiaries
- the separation (or “ring fencing”) of core banking products and services from markets activities
- the resolution of financial institutions
- requirements for executing or settling transactions on exchanges or through central counterparties (“CCPs”)
- position limits and reporting rules for derivatives
- governance and accountability regimes
- conduct of business and control requirements, and
- restrictions on compensation.

These types of differences, inconsistencies and conflicts in financial services regulation have required and could in the future require JPMorgan Chase to:

- divest assets or restructure its operations
- absorb increased operational, capital and liquidity costs
- change the prices that it charges for its products and services
- curtail the products and services that it offers to its customers and clients
- curtail other business opportunities, including acquisitions or principal investments, that it otherwise would have pursued, or
- incur higher costs for complying with different legal and regulatory frameworks.

Any or all of these factors could harm JPMorgan Chase’s ability to compete against other firms that are not subject to the same laws, rules and regulations or supervisory oversight, or harm JPMorgan Chase’s businesses, results of operations and profitability.

Resolving regulatory investigations can subject JPMorgan Chase to significant penalties and collateral consequences, and could result in higher compliance costs or restrictions on its operations.

JPMorgan Chase’s operations are subject to heightened oversight and scrutiny from regulatory authorities in many jurisdictions. JPMorgan Chase has paid significant fines, provided other monetary relief, incurred other penalties and experienced other repercussions in connection with resolving investigations and enforcement actions by governmental agencies. JPMorgan Chase could become subject to similar regulatory resolutions or other actions in the future, and addressing the requirements of any such resolutions or actions could result in JPMorgan Chase incurring higher operational and compliance costs, including devoting substantial resources to the required remediation, or needing to comply with other restrictions.

In connection with resolving specific regulatory investigations or enforcement actions, certain regulators have required JPMorgan Chase and other financial institutions to admit wrongdoing with respect to the activities that gave rise to the resolution. These types of admissions can lead to:

- greater exposure in litigation
- damage to reputation
- disqualification from doing business with certain clients or customers, or in specific jurisdictions, or
- other direct and indirect adverse effects.

Furthermore, U.S. government officials have demonstrated a willingness to bring criminal actions against financial institutions and have required that institutions plead guilty to criminal offenses or admit other wrongdoing in connection with resolving regulatory investigations or enforcement actions. Resolutions of this type can have significant collateral consequences for the subject financial institution, including:

- loss of clients, customers and business
- restrictions on offering certain products or services, and
- losing permission to operate certain businesses, either temporarily or permanently.

JPMorgan Chase expects that:

- it and other financial services firms will continue to be subject to heightened regulatory scrutiny and governmental investigations and enforcement actions
- regulators will continue to require that financial institutions be penalized for actual or deemed violations of law with formal and punitive enforcement actions, including the imposition of significant monetary and other sanctions, rather than resolving these matters through informal supervisory actions; and

- regulators will be more likely to pursue formal enforcement actions and resolutions against JPMorgan Chase to the extent that it has previously been subject to other governmental investigations or enforcement actions.

If JPMorgan Chase fails to meet the requirements of any resolution of a governmental investigation or enforcement action, or to maintain risk and control processes that meet the heightened standards and expectations of its regulators, it could be required to, among other things:

- enter into further resolutions of investigations or enforcement actions
- pay additional regulatory penalties or enter into judgments, or
- accept material regulatory restrictions on, or changes in the management of, its businesses.

In these circumstances, JPMorgan Chase could also become subject to other sanctions, or to prosecution or civil litigation with respect to the conduct that gave rise to an investigation or enforcement action.

JPMorgan Chase can face greater risks of non-compliance and incur higher operational and compliance costs under laws, rules and regulations relating to anti-money laundering, economic sanctions, embargo programs and anti-corruption.

JPMorgan Chase must comply with laws, rules and regulations throughout the world relating to anti-money laundering, economic sanctions, embargo programs and anti-corruption which can increase its risks of non-compliance and costs associated with the implementation and maintenance of complex compliance programs. A violation of any of these legal and regulatory requirements could subject JPMorgan Chase, or individual employees, to regulatory enforcement actions as well as significant civil and criminal penalties. In addition, certain national and multi-national bodies and governmental agencies outside the U.S. have adopted laws, rules or regulations that conflict with or prohibit a firm such as JPMorgan Chase from complying with laws, rules and regulations to which it is otherwise subject, creating conflict of law issues that also increase its risks of non-compliance in those jurisdictions.

JPMorgan Chase's operations and financial results can be negatively impacted in countries with less predictable legal and regulatory frameworks.

JPMorgan Chase conducts existing and new business in certain countries in which the application of the rule of law is inconsistent or less predictable, including with respect to:

- the absence of a statutory or regulatory basis or guidance for engaging in specific types of business or transactions
- conflicting or ambiguous laws, rules and regulations, or the inconsistent application or interpretation of existing laws, rules and regulations

- uncertainty concerning the enforceability of contractual, intellectual property or other obligations
- difficulty in competing in economies in which the government controls or protects all or a portion of the local economy or specific businesses, or where graft or corruption may be pervasive, and
- the threat of arbitrary regulatory investigations, civil litigations or criminal prosecutions, the termination of licenses required to operate in the local market or the suspension of business relationships with governmental bodies.

If the application of the laws, rules and regulations in a particular country is susceptible to producing inconsistent or unexpected outcomes, this can create a more difficult environment in which JPMorgan Chase conducts its business and could negatively affect JPMorgan Chase's operations and reduce its earnings with respect to that country. For example, conducting business could require JPMorgan Chase to devote significant additional resources to understanding, and monitoring changes in, local laws, rules and regulations, as well as structuring its operations to comply with local laws, rules and regulations and implementing and administering related internal policies and procedures.

There can be no assurance that JPMorgan Chase will always be successful in its efforts to fully understand and to conduct its business in compliance with the laws, rules and regulations of all of the jurisdictions in which it operates, and the risk of non-compliance can be greater in countries that have less predictable legal and regulatory systems.

Requirements for the orderly resolution of JPMorgan Chase could result in JPMorgan Chase having to restructure or reorganize its businesses and could increase its funding or operational costs or curtail its businesses.

JPMorgan Chase is required under Federal Reserve and FDIC rules to prepare and submit periodically to those agencies a detailed plan for rapid and orderly resolution in bankruptcy, without extraordinary government support, in the event of material financial distress or failure. The agencies' evaluation of JPMorgan Chase's resolution plan may change, and the requirements for resolution plans may be modified from time to time. Any such determinations or modifications could result in JPMorgan Chase needing to make changes to its legal entity structure or to certain internal or external activities, which could increase its funding or operational costs, or hamper its ability to serve clients and customers.

If the Federal Reserve and the FDIC were both to determine that a resolution plan submitted by JPMorgan Chase has deficiencies, they could jointly impose more stringent capital, leverage or liquidity requirements or restrictions on JPMorgan Chase's growth, activities or operations. The agencies could also require that JPMorgan Chase restructure, reorganize or divest assets or businesses in

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ways that could materially and adversely affect JPMorgan Chase's operations and strategy.

Holders of JPMorgan Chase & Co.'s debt and equity securities will absorb losses if it were to enter into a resolution.

Federal Reserve rules require that JPMorgan Chase & Co. (the "Parent Company") maintain minimum levels of unsecured external long-term debt and other loss-absorbing capacity with specific terms ("eligible LTD") for purposes of recapitalizing JPMorgan Chase's operating subsidiaries if the Parent Company were to enter into a resolution either:

- in a bankruptcy proceeding under Chapter 11 of the U.S. Bankruptcy Code, or
- in a receivership administered by the FDIC under Title II of the Dodd-Frank Act ("Title II").

If the Parent Company were to enter into a resolution, holders of eligible LTD and other debt and equity securities of the Parent Company will absorb the losses of the Parent Company and its subsidiaries.

The preferred "single point of entry" strategy under JPMorgan Chase's resolution plan contemplates that only the Parent Company would enter bankruptcy proceedings. JPMorgan Chase's subsidiaries would be recapitalized, as needed, so that they could continue normal operations or subsequently be divested or wound down in an orderly manner. As a result, the Parent Company's losses and any losses incurred by its subsidiaries would be imposed first on holders of the Parent Company's equity securities and thereafter on its unsecured creditors, including holders of eligible LTD and other debt securities. Claims of holders of those securities would have a junior position to the claims of creditors of JPMorgan Chase's subsidiaries and to the claims of priority (as determined by statute) and secured creditors of the Parent Company.

Accordingly, in a resolution of the Parent Company in bankruptcy, holders of eligible LTD and other debt securities of the Parent Company would realize value only to the extent available to the Parent Company as a shareholder of JPMorgan Chase Bank, N.A. and its other subsidiaries, and only after any claims of priority and secured creditors of the Parent Company have been fully repaid.

The FDIC has similarly indicated that a single point of entry recapitalization model could be a desirable strategy to resolve a systemically important financial institution, such as the Parent Company, under Title II. However, the FDIC has not formally adopted a single point of entry resolution strategy.

If the Parent Company were to approach, or enter into, a resolution, none of the Parent Company, the Federal Reserve or the FDIC is obligated to follow JPMorgan Chase's preferred resolution strategy, and losses to holders of eligible LTD and other debt and equity securities of the

Parent Company, under whatever strategy is ultimately followed, could be greater than they might have been under JPMorgan Chase's preferred strategy.

Political

Economic uncertainty or instability caused by political developments can negatively impact JPMorgan Chase's businesses.

Political developments in the U.S. and other countries can cause uncertainty in the economic environment and market conditions in which JPMorgan Chase operates its businesses. Certain monetary, fiscal and other policy initiatives and proposals could significantly affect U.S. and global economic growth and cause higher volatility in the financial markets, including:

- monetary policies and actions taken by the Federal Reserve and other central banks or governmental authorities, including any sustained large-scale asset purchases or any suspension or reversal of those actions
- fiscal policies, including with respect to taxation and spending
- actions that governments take or fail to take in response to the effects of the COVID-19 pandemic, as well as the effectiveness of any actions taken
- isolationist foreign policies
- an outbreak or escalation of hostilities or other geopolitical instabilities
- economic sanctions
- the implementation of tariffs and other protectionist trade policies, or
- other governmental policies or actions adopted or taken in response to political or social pressures.

These types of political developments, and uncertainty about the possible outcomes of these developments, could:

- erode investor confidence in the U.S. economy and financial markets, which could potentially undermine the status of the U.S. dollar as a safe haven currency
- provoke retaliatory countermeasures by other countries and otherwise heighten tensions in diplomatic relations
- lead to the withdrawal of government support for agencies and enterprises such as the U.S. Federal National Mortgage Association and the U.S. Federal Home Loan Mortgage Corporation (together, the "U.S. GSEs")
- increase concerns about whether the U.S. government will be funded, and its outstanding debt serviced, at any particular time
- result in periodic shutdowns of the U.S. government or governments in other countries

- increase investor reliance on actions by the Federal Reserve or other central banks, or influence investor perceptions concerning government support of sectors of the economy or the economy as a whole
- adversely affect the financial condition or credit ratings of clients and counterparties with which JPMorgan Chase does business, or
- cause JPMorgan Chase to refrain from engaging in business opportunities that it might otherwise pursue.

These factors could lead to:

- slower growth rates, rising inflation or recession
- greater market volatility
- a contraction of available credit and the widening of credit spreads
- erosion of adequate risk premium on certain financial assets
- diminished investor and consumer confidence
- lower investment growth
- large-scale sales of government debt and other debt and equity securities in the U.S. and other countries
- reduced commercial activity among trading partners
- the potential for a currency redenomination by a particular country
- the possible departure of a country from, or the dissolution of, a political or economic alliance or treaty
- potential expropriation or nationalization of assets, or
- other market dislocations, including the spread of unfavorable economic conditions from a particular country or region to other countries or regions.

Any of these potential outcomes could cause JPMorgan Chase to suffer losses on its market-making positions or in its investment portfolio, reduce its liquidity and capital levels, increase credit risk, hamper its ability to deliver products and services to its clients and customers, and weaken its results of operations and financial condition.

Market

Economic and market events and conditions can materially affect JPMorgan Chase's businesses and investment and market-making positions.

JPMorgan Chase's results of operations can be negatively affected by adverse changes in any of the following:

- investor, consumer and business sentiment
- events that reduce confidence in the financial markets
- inflation or deflation
- high unemployment or, conversely, a tightening labor market
- the availability and cost of capital, liquidity and credit

- levels and volatility of interest rates, credit spreads and market prices for currencies, equities and commodities, and the duration of any changes in levels or volatility
- the economic effects of an outbreak or escalation of hostilities, terrorism or other geopolitical instabilities, cyber attacks, climate change, natural disasters, severe weather conditions, health emergencies, the spread of infectious diseases, epidemics or pandemics or other extraordinary events beyond JPMorgan Chase's control, and
- the health of the U.S. and global economies.

All of these are affected by global economic, market and political events and conditions, as well as regulatory restrictions.

In addition, JPMorgan Chase's investment portfolio and market-making businesses can suffer losses due to unanticipated market events, including:

- severe declines in asset values
- unexpected credit events
- unforeseen events or conditions that may cause previously uncorrelated factors to become correlated (and vice versa)
- the inability to effectively hedge market and other risks related to market-making and investment portfolio positions, or
- other market risks that may not have been appropriately taken into account in the development, structuring or pricing of a financial instrument.

If JPMorgan Chase experiences significant losses in its investment portfolio or from market-making activities, this could reduce JPMorgan Chase's profitability and its liquidity and capital levels, and thereby constrain the growth of its businesses.

JPMorgan Chase's consumer businesses can be negatively affected by adverse economic conditions and governmental policies.

JPMorgan Chase's consumer businesses are particularly affected by U.S. and global economic conditions, including:

- personal and household income distribution
- unemployment or underemployment
- prolonged periods of exceptionally low interest rates
- housing prices
- the level of inflation and its effect on prices for goods and services
- consumer and small business confidence levels, and
- changes in consumer spending or in the level of consumer debt.

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Heightened levels of unemployment or underemployment that result in reduced personal and household income could negatively affect consumer credit performance to the extent that consumers are less able to service their debts. In addition, sustained low growth, low or negative interest rates, inflationary pressures or recessionary conditions could diminish customer demand for the products and services offered by JPMorgan Chase's consumer businesses.

Adverse economic conditions could also lead to an increase in delinquencies, additions to the allowance for credit losses and higher net charge-offs, which can reduce JPMorgan Chase's earnings. These consequences could be significantly worse in certain geographies and industry segments where declining industrial or manufacturing activity has resulted in or could result in higher levels of unemployment, or where high levels of consumer debt, such as outstanding student loans, could impair the ability of customers to pay their other consumer loan obligations.

JPMorgan Chase's earnings from its consumer businesses could also be adversely affected by governmental policies and actions that affect consumers, including:

- policies and initiatives relating to medical insurance, education, immigration, employment status and housing, and
- policies aimed at the economy more broadly, such as higher taxes and increased regulation which could result in reductions in consumer disposable income.

In addition, governmental proposals to permit student loan obligations to be discharged in bankruptcy proceedings could, if enacted into law, encourage certain of JPMorgan Chase's customers to declare personal bankruptcy and thereby trigger defaults and charge-offs of credit card and other consumer loans extended to those customers.

Unfavorable market and economic conditions can have an adverse effect on JPMorgan Chase's wholesale businesses.

In JPMorgan Chase's wholesale businesses, market and economic factors can affect the volume of transactions that JPMorgan Chase executes for its clients or for which it advises clients, and, therefore, the revenue that JPMorgan Chase receives from those transactions. These factors can also influence the willingness of other financial institutions and investors to participate in capital markets transactions that JPMorgan Chase manages, such as loan syndications or securities underwritings. Furthermore, if a significant and sustained deterioration in market conditions were to occur, the profitability of JPMorgan Chase's capital markets businesses, including its loan syndication, securities underwriting and leveraged lending activities, could be reduced to the extent that those businesses:

- earn less fee revenue due to lower transaction volumes, including when clients are unwilling or unable to refinance their outstanding debt obligations in unfavorable market conditions, or

- dispose of portions of credit commitments at a loss, or hold larger residual positions in credit commitments that cannot be sold at favorable prices.

An adverse change in market conditions in particular segments of the economy, such as a sudden and severe downturn in oil and gas prices or an increase in commodity prices, or sustained changes in consumer behavior that affect specific economic sectors, could have a material adverse effect on clients of JPMorgan Chase whose operations or financial condition are directly or indirectly dependent on the health or stability of those market segments or economic sectors, as well as clients that are engaged in related businesses. JPMorgan Chase could incur losses on its loans and other credit commitments to clients that operate in, or are dependent on, any sector of the economy that is under stress.

The fees that JPMorgan Chase earns from managing client assets or holding assets under custody for clients could be diminished by declining asset values or other adverse macroeconomic conditions. For example, higher interest rates or a downturn in financial markets could affect the valuations of client assets that JPMorgan Chase manages or holds under custody, which, in turn, could affect JPMorgan Chase's revenue from fees that are based on the amount of assets under management or custody. Similarly, adverse macroeconomic or market conditions could prompt outflows from JPMorgan Chase funds or accounts, or cause clients to invest in products that generate lower revenue. Substantial and unexpected withdrawals from a JPMorgan Chase fund can also hamper the investment performance of the fund, particularly if the outflows create the need for the fund to dispose of fund assets at disadvantageous times or prices, and could lead to further withdrawals based on the weaker investment performance.

An economic downturn or sustained changes in consumer behavior that results in shifts in consumer and business spending could also have a negative impact on certain of JPMorgan Chase's wholesale clients, and thereby diminish JPMorgan Chase's earnings from its wholesale operations. For example, the businesses of certain of JPMorgan Chase's wholesale clients are dependent on consistent streams of rental income from commercial real estate properties which are owned or being built by those clients. Sustained adverse economic conditions could result in reductions in the rental cash flows that owners or developers receive from their tenants which, in turn, could depress the values of the properties and impair the ability of borrowers to service or refinance their commercial real estate loans. These consequences could result in JPMorgan Chase experiencing increases in the allowance for credit losses, higher delinquencies, defaults and charge-offs within its commercial real estate loan portfolio and incurring higher costs for servicing a larger volume of delinquent loans in that portfolio, thereby reducing JPMorgan Chase's earnings from its wholesale businesses.

Changes in interest rates and credit spreads can adversely affect certain of JPMorgan Chase's revenue and income streams related to its traditional banking and funding activities.

In general, a low or negative interest rate environment may cause:

- net interest margins to be compressed, which could reduce the amounts that JPMorgan Chase earns on its investment securities portfolio to the extent that it is unable to reinvest contemporaneously in higher-yielding instruments
- unanticipated or adverse changes in depositor behavior, which could negatively affect JPMorgan Chase's broader asset and liability management strategy
- JPMorgan Chase to reduce the amount of deposits that it accepts from customers and clients, which could result in lower revenues, and
- a reduction in the value of JPMorgan Chase's mortgage servicing rights ("MSRs") asset, thereby decreasing revenues.

When credit spreads widen, it becomes more expensive for JPMorgan Chase to borrow. JPMorgan Chase's credit spreads may widen or narrow not only in response to events and circumstances that are specific to JPMorgan Chase but also as a result of general economic and geopolitical events and conditions. Changes in JPMorgan Chase's credit spreads will affect, positively or negatively, JPMorgan Chase's earnings on certain liabilities, such as derivatives, that are recorded at fair value.

When interest rates are increasing, JPMorgan Chase can generally be expected to earn higher net interest income. However, higher interest rates can also lead to:

- fewer originations of commercial and residential real estate loans
- losses on underwriting exposures
- the loss of deposits, including in the event that JPMorgan Chase makes incorrect assumptions about depositor behavior
- unrealized mark-to-market losses on available-for-sale ("AFS") securities held in the investment securities portfolio
- lower net interest income if central banks introduce interest rate increases more quickly than anticipated and this results in a misalignment in the pricing of short-term and long-term borrowings
- less liquidity in the financial markets, and
- higher funding costs.

All of these outcomes could adversely affect JPMorgan Chase's earnings or its liquidity and capital levels. Higher interest rates can also negatively affect the payment

performance on loans within JPMorgan Chase's consumer and wholesale loan portfolios that are linked to variable interest rates. If borrowers of variable rate loans are unable to afford higher interest payments, those borrowers may reduce or stop making payments, thereby causing JPMorgan Chase to incur losses and increased operational costs related to servicing a higher volume of delinquent loans.

JPMorgan Chase's results may be materially affected by market fluctuations and significant changes in the value of financial instruments.

The value of securities, derivatives and other financial instruments which JPMorgan Chase owns or in which it makes markets can be materially affected by market fluctuations. Market volatility, illiquid market conditions and other disruptions in the financial markets may make it extremely difficult to value certain financial instruments. Subsequent valuations of financial instruments in future periods, in light of factors then prevailing, may result in significant changes in the value of these instruments. In addition, at the time of any disposition of these financial instruments, the price that JPMorgan Chase ultimately realizes will depend on the demand and liquidity in the market at that time and may be materially lower than their current fair value. Any of these factors could cause a decline in the value of financial instruments that JPMorgan Chase owns or in which it makes markets, which may have an adverse effect on JPMorgan Chase's results of operations.

JPMorgan Chase's risk management and monitoring processes, including its stress testing framework, seek to quantify and control JPMorgan Chase's exposure to more extreme market moves. However, JPMorgan Chase's hedging and other risk management strategies may not be effective, and it could incur significant losses, if extreme market events were to occur.

Credit

JPMorgan Chase can be negatively affected by adverse changes in the financial condition of clients, counterparties, custodians and CCPs.

JPMorgan Chase routinely executes transactions with clients and counterparties such as corporations, financial institutions, asset managers, hedge funds, securities exchanges and government entities within and outside the U.S. Many of these transactions expose JPMorgan Chase to the credit risk of its clients and counterparties, and can involve JPMorgan Chase in disputes and litigation if a client or counterparty defaults. JPMorgan Chase can also be subject to losses or liability where a financial institution that it has appointed to provide custodial services for client assets or funds becomes insolvent as a result of fraud or the failure to abide by existing laws and obligations.

A default by, or the financial or operational failure of, a CCP through which JPMorgan Chase executes contracts would require JPMorgan Chase to replace those contracts, thereby

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increasing its operational costs and potentially resulting in losses. In addition, JPMorgan Chase can be exposed to losses if a member of a CCP in which JPMorgan Chase is also a member defaults on its obligations to the CCP because of requirements that each member of the CCP absorb a portion of those losses. Furthermore, JPMorgan Chase can be subject to bearing its share of non-default losses incurred by a CCP, including losses from custodial, settlement or investment activities or due to cyber or other security breaches.

As part of its clearing services activities, JPMorgan Chase is exposed to the risk of nonperformance by its clients, which it seeks to mitigate by requiring clients to provide adequate collateral. JPMorgan Chase is also exposed to intra-day credit risk of its clients in connection with providing cash management, clearing, custodial and other transaction services to those clients. If a client for which JPMorgan Chase provides these services becomes bankrupt or insolvent, JPMorgan Chase may incur losses, become involved in disputes and litigation with one or more CCPs, the client's bankruptcy estate and other creditors, or be subject to regulatory investigations. All of the foregoing events can increase JPMorgan Chase's operational and litigation costs, and JPMorgan Chase may suffer losses to the extent that any collateral that it has received is insufficient to cover those losses.

Transactions with government entities, including national, state, provincial, municipal and local authorities, can expose JPMorgan Chase to enhanced sovereign, credit, operational and reputation risks. Government entities may, among other things, claim that actions taken by government officials were beyond the legal authority of those officials or repudiate transactions authorized by a previous incumbent government. These types of actions have in the past caused, and could in the future cause, JPMorgan Chase to suffer losses or hamper its ability to conduct business in the relevant jurisdiction.

In addition, local laws, rules and regulations could limit JPMorgan Chase's ability to resolve disputes and litigation in the event of a counterparty default or unwillingness to make previously agreed-upon payments, which could subject JPMorgan Chase to losses.

Disputes may arise with counterparties to derivatives contracts with regard to the terms, the settlement procedures or the value of underlying collateral. The disposition of those disputes could cause JPMorgan Chase to incur unexpected transaction, operational and legal costs, or result in credit losses. These consequences can also impair JPMorgan Chase's ability to effectively manage its credit risk exposure from its market activities, or cause harm to JPMorgan Chase's reputation.

The financial or operational failure of a significant market participant, such as a major financial institution or a CCP, or concerns about the creditworthiness of such a market participant, can have a cascading effect within the financial markets. JPMorgan Chase's businesses could be

significantly disrupted by such an event, particularly if it leads to other market participants incurring significant losses, experiencing liquidity issues or defaulting, and JPMorgan Chase is likely to have significant interrelationships with, and credit exposure to, such a significant market participant.

JPMorgan Chase may suffer losses if the value of collateral declines in stressed market conditions.

During periods of market stress or illiquidity, JPMorgan Chase's credit risk may be further increased when:

- JPMorgan Chase fails to realize the fair value of the collateral it holds
- collateral is liquidated at prices that are not sufficient to recover the full amount owed to it, or
- counterparties are unable to post collateral, whether for operational or other reasons.

Furthermore, disputes with counterparties concerning the valuation of collateral may increase in times of significant market stress, volatility or illiquidity, and JPMorgan Chase could suffer losses during these periods if it is unable to realize the fair value of collateral or to manage declines in the value of collateral.

JPMorgan Chase could incur significant losses arising from concentrations of credit and market risk.

JPMorgan Chase is exposed to greater credit and market risk to the extent that groupings of its clients or counterparties:

- engage in similar or related businesses, or in businesses in related industries
- do business in the same geographic region, or
- have business profiles, models or strategies that could cause their ability to meet their obligations to be similarly affected by changes in economic conditions.

For example, a significant deterioration in the credit quality of one of JPMorgan Chase's borrowers or counterparties could lead to concerns about the creditworthiness of other borrowers or counterparties in similar, related or dependent industries. This type of interrelationship could exacerbate JPMorgan Chase's credit, liquidity and market risk exposure and potentially cause it to incur losses, including fair value losses in its market-making businesses and investment portfolios. In addition, JPMorgan Chase may be required to increase the allowance for credit losses with respect to certain clients or industries in order to align with directives or expectations of its banking regulators.

Similarly, challenging economic conditions that affect a particular industry or geographic area could lead to concerns about the credit quality of JPMorgan Chase's borrowers or counterparties not only in that particular industry or geography but in related or dependent industries, wherever located. These conditions could also heighten concerns about the ability of customers of

JPMorgan Chase's consumer businesses who live in those areas or work in those affected industries or related or dependent industries to meet their obligations to JPMorgan Chase. JPMorgan Chase regularly monitors various segments of its credit and market risk exposures to assess the potential risks of concentration or contagion, but its efforts to diversify or hedge its exposures against those risks may not be successful.

JPMorgan Chase's consumer businesses can also be harmed by an excessive expansion of consumer credit by bank or non-bank competitors. Heightened competition for certain types of consumer loans could prompt industry-wide reactions such as significant reductions in the pricing or margins of those loans or the making of loans to less-creditworthy borrowers. If large numbers of consumers subsequently default on their loans, whether due to weak credit profiles, an economic downturn or other factors, this could impair their ability to repay obligations owed to JPMorgan Chase and result in higher charge-offs and other credit-related losses. More broadly, widespread defaults on consumer debt could lead to recessionary conditions in the U.S. economy, and JPMorgan Chase's consumer businesses may earn lower revenues in such an environment.

If JPMorgan Chase is unable to reduce positions effectively during a market dislocation, this can increase both the market and credit risks associated with those positions and the level of RWA that JPMorgan Chase holds on its balance sheet. These factors could adversely affect JPMorgan Chase's capital position, funding costs and the profitability of its businesses.

Liquidity

JPMorgan Chase's ability to operate its businesses could be impaired if its liquidity is constrained.

JPMorgan Chase's liquidity could be impaired at any given time by factors such as:

- market-wide illiquidity or disruption
- unforeseen liquidity or capital requirements, including as a result of changes in laws, rules and regulations
- inability to sell assets, or to sell assets at favorable times or prices
- default by a CCP or other significant market participant
- unanticipated outflows of cash or collateral
- unexpected loss of consumer deposits or higher than anticipated draws on lending-related commitments, and
- lack of market or customer confidence in JPMorgan Chase or financial institutions in general.

A reduction in JPMorgan Chase's liquidity may be caused by events over which it has little or no control. For example, during periods of market stress, low investor confidence and significant market illiquidity could result in higher

funding costs for JPMorgan Chase and could limit its access to some of its traditional sources of liquidity.

JPMorgan Chase may need to raise funding from alternative sources if its access to stable and lower-cost sources of funding, such as deposits and borrowings from Federal Home Loan Banks, is reduced. Alternative sources of funding could be more expensive or limited in availability. JPMorgan Chase's funding costs could also be negatively affected by actions that JPMorgan Chase may take in order to:

- satisfy applicable liquidity coverage ratio and net stable funding ratio requirements
- address obligations under its resolution plan, or
- satisfy regulatory requirements in jurisdictions outside the U.S. relating to the pre-positioning of liquidity in subsidiaries that are material legal entities.

More generally, if JPMorgan Chase fails to effectively manage its liquidity, this could constrain its ability to fund or invest in its businesses and subsidiaries, and thereby adversely affect its results of operations.

JPMorgan Chase & Co. is a holding company and depends on the cash flows of its subsidiaries to make payments on its outstanding securities.

JPMorgan Chase & Co. is a holding company that holds the stock of JPMorgan Chase Bank, N.A. and an intermediate holding company, JPMorgan Chase Holdings LLC (the "IHC"). The IHC in turn generally holds the stock of JPMorgan Chase's subsidiaries other than JPMorgan Chase Bank, N.A. and its subsidiaries. The IHC also owns other assets and provides intercompany lending to the holding company.

The holding company is obligated to contribute to the IHC substantially all the net proceeds received from securities issuances (including issuances of senior and subordinated debt securities and of preferred and common stock).

The ability of JPMorgan Chase Bank, N.A. and the IHC to make payments to the holding company is also limited. JPMorgan Chase Bank, N.A. is subject to regulatory restrictions on its dividend distributions, as well as capital adequacy requirements, such as the Supplementary Leverage Ratio ("SLR"), and liquidity requirements and other regulatory restrictions on its ability to make payments to the holding company. The IHC is prohibited from paying dividends or extending credit to the holding company if certain capital or liquidity thresholds are breached or if limits are otherwise imposed by JPMorgan Chase's management or Board of Directors.

As a result of these arrangements, the ability of the holding company to make various payments is dependent on its receiving dividends from JPMorgan Chase Bank, N.A. and dividends and borrowings from the IHC. These limitations could affect the holding company's ability to:

- pay interest on its debt securities

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- pay dividends on its equity securities
- redeem or repurchase outstanding securities, and
- fulfill its other payment obligations.

These arrangements could also result in the holding company seeking protection under bankruptcy laws or otherwise entering into resolution proceedings at a time earlier than would have been the case absent the existence of the capital and liquidity thresholds to which the IHC is subject.

Reductions in JPMorgan Chase's credit ratings may adversely affect its liquidity and cost of funding.

JPMorgan Chase & Co. and certain of its principal subsidiaries are rated by credit rating agencies. Rating agencies evaluate both general and firm-specific and industry-specific factors when determining credit ratings for a particular financial institution, including:

- expected future profitability
- risk management practices
- legal expenses
- ratings differentials between bank holding companies and their bank and non-bank subsidiaries
- regulatory developments
- assumptions about government support, and
- economic and geopolitical developments.

JPMorgan Chase closely monitors and manages, to the extent that it is able, factors that could influence its credit ratings. However, there is no assurance that JPMorgan Chase's credit ratings will not be lowered in the future. Furthermore, any such downgrade could occur at times of broader market instability when JPMorgan Chase's options for responding to events may be more limited and general investor confidence is low.

A reduction in JPMorgan Chase's credit ratings could curtail JPMorgan Chase's business activities and reduce its profitability in a number of ways, including:

- reducing its access to capital markets
- materially increasing its cost of issuing and servicing securities
- triggering additional collateral or funding requirements, and
- decreasing the number of investors and counterparties that are willing or permitted to do business with or lend to JPMorgan Chase.

Any rating reduction could also increase the credit spreads charged by the market for taking credit risk on JPMorgan Chase & Co. and its subsidiaries. This could, in turn, adversely affect the value of debt and other obligations of JPMorgan Chase & Co. and its subsidiaries.

The reform and replacement of benchmark rates could adversely affect financial instruments issued, funded, serviced or held by JPMorgan Chase and expose it to litigation and other disputes.

Interest rate, equity, foreign exchange rate and other types of indices which are deemed to be "benchmarks," including those in widespread and longstanding use, have been the subject of ongoing international, national and other regulatory scrutiny and initiatives for reform, including:

- changes to the rules and methodologies under which certain benchmarks are administered
- initiatives designed to discourage or prohibit the use of certain benchmarks by market participants
- the introduction of alternative reference rates to be used by market participants in lieu of certain benchmarks, and
- legislative proposals and actions providing for the replacement of reference rates under existing contracts and instruments that are linked to certain benchmarks with alternative reference rates.

Some of these reforms are already effective while others are still to be implemented or are under consideration. These and other reforms relating to benchmarks could:

- cause certain benchmarks to be substantially modified or to be permanently discontinued
- lead to disruptions in the financial markets, including in connection with the transition to alternative reference rates
- give rise to litigation and other disputes
- cause reputational harm to the extent that operational and technology systems are not sufficiently prepared for the transition to alternative reference rates, or
- have other consequences which cannot be fully anticipated.

Any of these developments, and any future initiatives to regulate, reform or change the administration of benchmarks, could result in adverse consequences to the return on, value of and market for loans, mortgages, securities, derivatives and other financial instruments whose returns are linked to any such benchmark, including those issued, funded, serviced or held by JPMorgan Chase.

Changes in the manner in which certain benchmarks are administered, or the general increased regulatory scrutiny of those benchmarks, could increase the costs and risks of administering or otherwise participating in the setting of those benchmarks and complying with regulations or requirements relating to those benchmarks. Such factors may have the effect of discouraging market participants from continuing to administer or contribute to certain benchmarks, trigger further changes in the rules or methodologies under which certain benchmarks are

administered or lead to the discontinuation of certain benchmarks.

Regulators, industry bodies and other market participants in the U.S. and other countries continue to engage in initiatives to develop, introduce and encourage the use of alternative reference rates to replace certain benchmarks, and certain of these alternative rates have gained or are gaining acceptance among market participants. However, there is no assurance that:

- any of these new rates will be similar to, or produce the economic equivalent of, the benchmarks that they seek to replace
- arrangements by market participants to prepare for the discontinuation of certain benchmarks and the transition to alternative reference rates will be fully effective, or
- a particular alternative reference rate will be widely accepted by market participants, or that market acceptance of that rate will not be hindered by the introduction of other reference rates.

If a particular benchmark were to be discontinued and an alternative reference rate has not been successfully introduced or widely accepted within the market, this could result in significant adverse effects on the financial markets. For example, vast amounts of loans, mortgages, securities, derivatives and other financial instruments are linked to the London Interbank Offered Rate (“LIBOR”) benchmark. ICE Benchmark Administration, the administrator of LIBOR, has announced that the publication of the principal tenors of U.S. dollar LIBOR will cease after June 30, 2023, and significant progress has been made by regulators, industry bodies and market participants to introduce and implement the Secured Overnight Financing Rate (“SOFR”) as a replacement rate for U.S. dollar LIBOR. However, if an alternative reference rate such as SOFR has not achieved sufficient market acceptance when the publication of the principal tenors of U.S. dollar LIBOR is discontinued, or if market participants have not otherwise implemented effective transitional arrangements to address that discontinuation, this could result in widespread dislocation in the financial markets, volatility in the pricing of securities, derivatives and other instruments, and the suppression of capital markets activities, all of which could have a negative impact on JPMorgan Chase’s results of operations and on U.S. dollar LIBOR-linked securities, credit or other instruments which are issued, funded, serviced or held by JPMorgan Chase.

JPMorgan Chase could also become involved in litigation and other types of disputes with clients, customers, counterparties and investors as a consequence of the transition from U.S. dollar LIBOR and other benchmark rates to replacement rates, including claims that JPMorgan Chase has:

- treated clients, customers, counterparties or investors unfairly, or caused them to experience losses, higher financing costs or lower returns on investments
- failed to appropriately communicate the effects of the transition from benchmark rates on the products that JPMorgan Chase has sold to its clients and customers, or failed to disclose purported conflicts of interest
- made inappropriate product recommendations to or investments on behalf of its clients, or sold products that did not serve their intended purpose, in connection with the transition from benchmark rates
- engaged in anti-competitive behavior, or in the manipulation of markets or specific benchmarks, in connection with the discontinuation of or transition from benchmark rates, or
- disadvantaged clients, customers, counterparties or investors when interpreting or making determinations under the terms of agreements or financial instruments.

These types of claims could subject JPMorgan Chase to higher legal expenses and operational costs, require it to pay significant amounts in connection with resolving litigation and other disputes, and harm its reputation.

Capital

Maintaining the required level and composition of capital may impact JPMorgan Chase’s ability to support business activities, meet evolving regulatory requirements and distribute capital to shareholders.

JPMorgan Chase is subject to various regulatory capital requirements, including leverage- and risk-based capital requirements. In addition, as a Globally Systemically Important Bank (“GSIB”), JPMorgan Chase is required to hold additional capital buffers, including a GSIB surcharge, a SCB, and a countercyclical buffer, each of which is reassessed at least annually. The amount of capital that JPMorgan Chase is required to hold in order to satisfy these leverage- and risk-based requirements could increase at any given time due to factors such as:

- actions by banking regulators, including changes in laws, rules, and regulations
- actions taken by the Federal Reserve or the U.S. government in response to the economic effects of systemic events, such as the actions taken in response to the COVID-19 pandemic which led to an expansion of the Federal Reserve balance sheet, growth in deposits held by JPMorgan Chase and other U.S. financial institutions and, consequently, an increase in leverage exposure and the GSIB surcharge
- changes in the composition of JPMorgan Chase’s balance sheet or developments that could increase risk weighted assets such as increased market risk, customer delinquencies, client credit rating downgrades or other factors, and

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- increases in estimated stress losses as determined by the Federal Reserve under the Comprehensive Capital Analysis and Review, which could increase JPMorgan Chase's SCB.

Any failure by or inability of JPMorgan Chase to maintain the required level and composition of capital, or unfavorable changes in applicable capital requirements, could have an adverse impact on JPMorgan Chase's shareholders, such as:

- reducing the amount of common stock that JPMorgan Chase is permitted to repurchase
- requiring the issuance of, or prohibiting the redemption of, capital instruments in a manner inconsistent with JPMorgan Chase's capital management strategy
- constraining the amount of dividends that may be paid on common stock, or
- curtailing JPMorgan Chase's business activities or operations.

Operational

JPMorgan Chase's businesses are dependent on the effectiveness of its operational systems and those of other market participants.

JPMorgan Chase's businesses rely on the ability of JPMorgan Chase's financial, accounting, transaction execution, data processing and other operational systems to process, record, monitor and report a large number of transactions on a continuous basis, and to do so accurately, quickly and securely. In addition to proper design, installation, maintenance and training, the effective functioning of JPMorgan Chase's operational systems depends on:

- the quality of the information contained in those systems, as inaccurate, outdated or corrupted data can significantly compromise the functionality or reliability of a particular system and other systems to which it transmits or from which it receives information, and
- the ability of JPMorgan Chase to appropriately maintain and upgrade its systems on a regular basis, and to ensure that any changes introduced to its systems are managed carefully to ensure security and operational continuity and adhere to all applicable legal and regulatory requirements.

JPMorgan Chase also depends on its ability to access and use the operational systems of its vendors, custodians and other market participants, including clearing and payment systems, CCPs, securities exchanges and data processing, security and technology companies (including those that provide cloud computing services).

The ineffectiveness, failure or other disruption of operational systems upon which JPMorgan Chase depends, including due to a systems malfunction, cyberbreach or other systems failure, could result in unfavorable ripple

effects in the financial markets and for JPMorgan Chase and its clients and customers, including:

- delays or other disruptions in providing services, liquidity or information to clients and customers
- the inability to settle transactions or obtain access to funds and other assets, including those for which physical settlement and delivery is required
- failure to timely settle or confirm transactions
- the possibility that funds transfers, capital markets trades or other transactions are executed erroneously, as a result of illegal conduct or with unintended consequences
- financial losses, including due to loss-sharing requirements of CCPs, payment systems or other market infrastructures, or as possible restitution to clients and customers
- higher operational costs associated with replacing services provided by a system that is unavailable
- client or customer dissatisfaction with JPMorgan Chase's products and services
- regulatory fines, penalties, or other sanctions against JPMorgan Chase
- loss of confidence in the ability of JPMorgan Chase, or financial institutions generally, to protect against and withstand operational disruptions, or
- harm to JPMorgan Chase's reputation.

As the speed, frequency, volume, interconnectivity and complexity of transactions continue to increase, it can become more challenging to effectively maintain and upgrade JPMorgan Chase's operational systems and infrastructure, especially due to the heightened risks that:

- attempts by third parties to defraud JPMorgan Chase or its clients and customers may increase, evolve or become more complex, particularly during periods of market disruption or economic uncertainty
- errors made by JPMorgan Chase or another market participant, whether inadvertent or malicious, cause widespread system disruption
- isolated or seemingly insignificant errors in operational systems compound, or migrate to other systems over time, to become larger issues
- failures in synchronization or encryption software, or degraded performance of microprocessors, could cause disruptions in operational systems, or the inability of systems to communicate with each other, and
- third parties may attempt to block the use of key technology solutions by claiming that the use infringes on their intellectual property rights.

If JPMorgan Chase's operational systems, or those of newly-acquired businesses or of external parties on which

JPMorgan Chase's businesses depend, are unable to meet the requirements of JPMorgan Chase's businesses and operations or bank regulatory standards, or if they fail or have other significant shortcomings, JPMorgan Chase could be materially and adversely affected.

A successful cyber attack affecting JPMorgan Chase could cause significant harm to JPMorgan Chase and its clients and customers.

JPMorgan Chase experiences numerous attempted cyber attacks on its computer systems, software, networks and other technology assets on a daily basis from various actors, including groups acting on behalf of hostile countries, cyber-criminals, "hacktivists" (i.e., individuals or groups that use technology to promote a political agenda or social change) and others. These cyber attacks can take many forms, including attempts to introduce computer viruses or malicious code, which are commonly referred to as "malware," into JPMorgan Chase's systems. These attacks are often designed to:

- obtain unauthorized access to confidential information belonging to JPMorgan Chase or its clients, customers, counterparties or employees
- manipulate data
- destroy data or systems with the aim of rendering services unavailable
- disrupt, sabotage or degrade service on JPMorgan Chase's systems
- steal money, or
- extort money through the use of so-called "ransomware."

JPMorgan Chase has also experienced significant distributed denial-of-service attacks which are intended to disrupt online banking services.

JPMorgan Chase has experienced security breaches due to cyber attacks in the past, and it is inevitable that additional breaches will occur in the future. Any such breach could result in serious and harmful consequences for JPMorgan Chase or its clients and customers.

A principal reason that JPMorgan Chase cannot provide absolute security against cyber attacks is that it may not always be possible to anticipate, detect or recognize threats to JPMorgan Chase's systems, or to implement effective preventive measures against all breaches. This is because:

- the techniques used in cyber attacks change frequently and are increasingly sophisticated, and therefore may not be recognized until launched
- cyber attacks can originate from a wide variety of sources, including JPMorgan Chase's own employees, cyber-criminals, hacktivists, groups linked to terrorist organizations or hostile countries, or third parties whose objective is to disrupt the operations of financial institutions more generally

- JPMorgan Chase does not have control over the cybersecurity of the systems of the large number of clients, customers, counterparties and third-party service providers with which it does business, and
- it is possible that a third party, after establishing a foothold on an internal network without being detected, might obtain access to other networks and systems.

The risk of a security breach due to a cyber attack could increase in the future due to factors such as:

- JPMorgan Chase's ongoing expansion of its mobile banking and other internet-based product offerings and its internal use of internet-based products and applications, including those that use cloud computing services
- the acquisition of new businesses, and
- the increased use of remote access and third party video conferencing solutions to facilitate work-from-home arrangements for employees.

In addition, a third party could misappropriate confidential information obtained by intercepting signals or communications from mobile devices used by JPMorgan Chase's employees.

A successful penetration or circumvention of the security of JPMorgan Chase's systems or the systems of a vendor, governmental body or another market participant could cause serious negative consequences, including:

- significant disruption of JPMorgan Chase's operations and those of its clients, customers and counterparties, including losing access to operational systems
- misappropriation of confidential information of JPMorgan Chase or that of its clients, customers, counterparties, employees or regulators
- disruption of or damage to JPMorgan Chase's systems and those of its clients, customers and counterparties
- the inability, or extended delays in the ability, to fully recover and restore data that has been stolen, manipulated or destroyed, or the inability to prevent systems from processing fraudulent transactions
- violations by JPMorgan Chase of applicable privacy and other laws
- financial loss to JPMorgan Chase or to its clients, customers, counterparties or employees
- loss of confidence in JPMorgan Chase's cybersecurity and business resiliency measures
- dissatisfaction among JPMorgan Chase's clients, customers or counterparties
- significant exposure to litigation and regulatory fines, penalties or other sanctions, and
- harm to JPMorgan Chase's reputation.

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The extent of a particular cyber attack and the steps that JPMorgan Chase may need to take to investigate the attack may not be immediately clear, and it may take a significant amount of time before such an investigation can be completed. While such an investigation is ongoing, JPMorgan Chase may not necessarily know the full extent of the harm caused by the cyber attack, and that damage may continue to spread. These factors may inhibit JPMorgan Chase's ability to provide rapid, full and reliable information about the cyber attack to its clients, customers, counterparties and regulators, as well as the public. Furthermore, it may not be clear how best to contain and remediate the harm caused by the cyber attack, and certain errors or actions could be repeated or compounded before they are discovered and remediated. Any or all of these factors could further increase the costs and consequences of a cyber attack.

JPMorgan Chase can be negatively affected if it fails to identify and address operational risks associated with the introduction of or changes to products, services and delivery platforms.

When JPMorgan Chase launches a new product or service, introduces a new platform for the delivery or distribution of products or services (including mobile connectivity, electronic trading and cloud computing), acquires or invests in a business or makes changes to an existing product, service or delivery platform, it may not fully appreciate or identify new operational risks that may arise from those changes, or may fail to implement adequate controls to mitigate the risks associated with those changes. Any significant failure in this regard could diminish JPMorgan Chase's ability to operate one or more of its businesses or result in:

- potential liability to clients, counterparties and customers
- increased operating expenses
- higher litigation costs, including regulatory fines, penalties and other sanctions
- damage to JPMorgan Chase's reputation
- impairment of JPMorgan Chase's liquidity
- regulatory intervention, or
- weaker competitive standing.

Any of the foregoing consequences could materially and adversely affect JPMorgan Chase's businesses and results of operations.

JPMorgan Chase's operational costs and customer satisfaction could be adversely affected by the failure of an external operational system.

External operational systems with which JPMorgan is connected, whether directly or indirectly, can be sources of operational risk to JPMorgan Chase. JPMorgan Chase may be exposed not only to a systems failure or cyber attack that may be experienced by a vendor or market

infrastructure with which JPMorgan Chase is directly connected, but also to a systems breakdown or cyber attack involving another party to which such a vendor or infrastructure is connected. Similarly, retailers, data aggregators and other external parties with which JPMorgan Chase's customers do business can increase JPMorgan Chase's operational risk. This is particularly the case where activities of customers or those parties are beyond JPMorgan Chase's security and control systems, including through the use of the internet, cloud computing services, and personal smart phones and other mobile devices or services.

If an external party obtains access to customer account data on JPMorgan Chase's systems, and that party experiences a cyberbreach of its own systems or misappropriates that data, this could result in a variety of negative outcomes for JPMorgan Chase and its clients and customers, including:

- heightened risk that external parties will be able to execute fraudulent transactions using JPMorgan Chase's systems
- losses from fraudulent transactions, as well as potential liability for losses that exceed thresholds established in consumer protection laws, rules and regulations
- increased operational costs to remediate the consequences of the external party's security breach, and
- reputational harm arising from the perception that JPMorgan Chase's systems may not be secure.

As JPMorgan Chase's interconnectivity with clients, customers and other external parties continues to expand, JPMorgan Chase increasingly faces the risk of operational failure or cyber attacks with respect to the systems of those parties. Security breaches affecting JPMorgan Chase's clients or customers, or systems breakdowns or failures, security breaches or human error or misconduct affecting other external parties, may require JPMorgan Chase to take steps to protect the integrity of its own operational systems or to safeguard confidential information, including restricting the access of customers to their accounts. These actions can increase JPMorgan Chase's operational costs and potentially diminish customer satisfaction and confidence in JPMorgan Chase.

Furthermore, the widespread and expanding interconnectivity among financial institutions, clearing banks, CCPs, payment processors, financial technology companies, securities exchanges, clearing houses and other financial market infrastructures increases the risk that the disruption of an operational system involving one institution or entity, including due to a cyber attack, may cause industry-wide operational disruptions that could materially affect JPMorgan Chase's ability to conduct business.

JPMorgan Chase's operations rely on its ability, and the ability of key external parties, to maintain appropriately-staffed workforces, and on the competence, trustworthiness, health and safety of employees.

JPMorgan Chase's ability to operate its businesses efficiently and profitably, to offer products and services that meet the expectations of its clients and customers, and to maintain an effective risk management framework is highly dependent on its ability to staff its operations appropriately and on the competence, integrity, health and safety of its employees. JPMorgan Chase is similarly dependent on the workforces of other parties on which JPMorgan Chase's operations rely, including vendors, custodians and financial markets infrastructures. JPMorgan Chase's businesses could be materially and adversely affected by:

- the ineffective implementation of business decisions
- any failure to institute controls that appropriately address risks associated with business activities, or to appropriately train employees with respect to those risks and controls
- staffing shortages, particularly in tight labor markets
- a significant operational breakdown or failure, theft, fraud or other unlawful conduct, or
- other negative outcomes caused by human error or misconduct by an employee of JPMorgan Chase or of another party on which JPMorgan Chase's operations depend.

JPMorgan Chase's operations could also be impaired if the measures taken by it or by governmental authorities to help ensure the health and safety of its employees are ineffective, or if any external party on which JPMorgan Chase relies fails to take appropriate and effective actions to protect the health and safety of its employees.

JPMorgan Chase faces substantial legal and operational risks in safeguarding personal information.

JPMorgan Chase's businesses are subject to complex and evolving laws, rules and regulations, both within and outside the U.S., governing the privacy and protection of personal information of individuals. The protected parties can include:

- JPMorgan Chase's current, prospective and former clients and customers
- clients and customers of JPMorgan Chase's clients and customers
- current, prospective and former employees, and
- employees of JPMorgan Chase's vendors, counterparties and other external parties.

Ensuring that JPMorgan Chase's collection, use, sharing and storage of personal information comply with all applicable laws, rules and regulations in all relevant jurisdictions, including where the laws of different jurisdictions are in conflict, can:

- increase JPMorgan Chase's compliance and operating costs
- hinder the development of new products or services, curtail the offering of existing products or services, or affect how products and services are offered to clients and customers
- demand significant oversight by JPMorgan Chase's management, and
- require JPMorgan Chase to structure its businesses, operations and systems in less efficient ways.

Not all of JPMorgan Chase's clients, customers, vendors, counterparties and other external parties may have appropriate controls in place to protect the confidentiality of the information exchanged between them and JPMorgan Chase, particularly where information is transmitted by electronic means. JPMorgan Chase could be exposed to litigation or regulatory fines, penalties or other sanctions if personal information of clients, customers, employees or others were to be mishandled or misused, such as situations where such information is:

- erroneously provided to parties who are not permitted to have the information, or
- intercepted or otherwise compromised by unauthorized third parties.

Concerns regarding the effectiveness of JPMorgan Chase's measures to safeguard personal information, or even the perception that those measures are inadequate, could cause JPMorgan Chase to lose existing or potential clients and customers, and thereby reduce JPMorgan Chase's revenues. Furthermore, any failure or perceived failure by JPMorgan Chase to comply with applicable privacy or data protection laws, rules and regulations may subject it to inquiries, examinations and investigations that could result in requirements to modify or cease certain operations or practices, significant liabilities or regulatory fines, penalties or other sanctions. Any of these could damage JPMorgan Chase's reputation and otherwise adversely affect its businesses.

In recent years, well-publicized incidents involving the inappropriate collection, use, sharing or storage of personal information have led to expanded governmental scrutiny of practices relating to the safeguarding of personal information by companies in the U.S. and other countries. That scrutiny has in some cases resulted in, and could in the future lead to, the adoption of stricter laws, rules and regulations relating to the collection, use, sharing and storage of personal information. These types of laws, rules and regulations could prohibit or significantly restrict financial services firms such as JPMorgan Chase from sharing information among affiliates or with third parties such as vendors, and thereby increase compliance costs, or could restrict JPMorgan Chase's use of personal data when developing or offering products or services to customers. These restrictions could also inhibit JPMorgan Chase's

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development or marketing of certain products or services, or increase the costs of offering them to customers.

JPMorgan Chase's operations, results and reputation could be harmed by occurrences of extraordinary events beyond its control.

JPMorgan Chase's business and operational systems could be seriously disrupted, and its reputation could be harmed, by events or contributing factors that are wholly or partially beyond its control, including material instances of:

- cyber attacks
- security breaches of its physical premises, including threats to health and safety
- power, telecommunications or internet outages, or shutdowns of mass transit
- failure of, or loss of access to, technology or operational systems, including any resulting loss of critical data
- damage to or loss of property or assets of JPMorgan Chase or third parties, and any consequent injuries, including in connection with any construction projects undertaken by JPMorgan Chase
- effects of climate change
- natural disasters or severe weather conditions
- accidents such as explosions or structural failures
- health emergencies, the spread of infectious diseases, epidemics or pandemics, or
- events arising from local or larger-scale civil unrest, any outbreak or escalation of hostilities or terrorist acts.

JPMorgan Chase maintains a Firmwide resiliency program that is intended to enable it to recover critical business functions and supporting assets, including staff, technology and facilities, in the event of a business disruption, including due to the occurrence of an extraordinary event beyond its control. There can be no assurance that JPMorgan Chase's resiliency plans will fully mitigate all potential business continuity risks to JPMorgan Chase, its clients, and customers and third parties with which it does business, or that its resiliency plans will be adequate to address the effects of simultaneous occurrences of multiple business disruption events. In addition, JPMorgan Chase's ability to respond effectively to a business disruption event could be hampered to the extent that the members of its workforce, physical assets or systems and other support infrastructure needed to address the event are geographically dispersed, or conversely, if such an event were to occur in an area in which they are concentrated. Further, should extraordinary events or the factors that cause or contribute to those events become more chronic, the disruptive effects of those events on JPMorgan Chase's business and operations, and on its clients, customers,

counterparties and employees, could become more significant and long-lasting.

Any significant failure or disruption of JPMorgan Chase's operations or operational systems, or the occurrence of one or more extraordinary events that are beyond its control, could:

- hinder JPMorgan Chase's ability to provide services to its clients and customers or to transact with its counterparties
- require it to expend significant resources to correct the failure or disruption or to address the event
- cause it to incur losses or liabilities, including from loss of revenue, damage to or loss of property, or injuries
- disrupt market infrastructure systems on which JPMorgan Chase's businesses rely
- expose it to litigation or regulatory fines, penalties or other sanctions, and
- harm its reputation.

Enhanced regulatory and other standards for the oversight of vendors and other service providers can result in higher costs and other potential exposures.

JPMorgan Chase must comply with enhanced regulatory and other standards associated with doing business with vendors and other service providers, including standards relating to the outsourcing of functions as well as the performance of significant banking and other functions by subsidiaries. JPMorgan Chase incurs significant costs and expenses in connection with its initiatives to address the risks associated with oversight of its internal and external service providers. JPMorgan Chase's failure to appropriately assess and manage these relationships, especially those involving significant banking functions, shared services or other critical activities, could materially adversely affect JPMorgan Chase. Specifically, any such failure could result in:

- potential harm to clients and customers, and any liability associated with that harm
- regulatory fines, penalties or other sanctions
- lower revenues, and the opportunity cost from lost revenues
- increased operational costs, or
- harm to JPMorgan Chase's reputation.

JPMorgan Chase's risk management framework may not be effective in identifying and mitigating every risk to JPMorgan Chase.

Any inadequacy or lapse in JPMorgan Chase's risk management framework, governance structure, practices, models or reporting systems could expose it to unexpected losses, and its financial condition or results of operations could be materially and adversely affected. Any such inadequacy or lapse could:

- hinder the timely escalation of material risk issues to JPMorgan Chase’s senior management and Board of Directors
- lead to business decisions that have negative outcomes for JPMorgan Chase
- require significant resources and time to remediate
- lead to non-compliance with laws, rules and regulations
- attract heightened regulatory scrutiny
- expose JPMorgan Chase to regulatory investigations or legal proceedings
- subject it to litigation or regulatory fines, penalties or other sanctions
- lead to potential harm to customers and clients, and any liability associated with that harm
- harm its reputation, or
- otherwise diminish confidence in JPMorgan Chase.

JPMorgan Chase relies on data to assess its various risk exposures. Any deficiencies in the quality or effectiveness of JPMorgan Chase’s data gathering, analysis and validation processes could result in ineffective risk management practices. These deficiencies could also result in inaccurate risk reporting.

Many of JPMorgan Chase’s risk management strategies and techniques consider historical market behavior and to some degree are based on management’s subjective judgment or assumptions. For example, many models used by JPMorgan Chase are based on assumptions regarding historical correlations among prices of various asset classes or other market indicators. In times of market stress, including difficult or less liquid market environments, or in the event of other unforeseen circumstances, previously uncorrelated indicators may become correlated. Conversely, previously-correlated indicators may become uncorrelated at those times. Sudden market movements and unanticipated market or economic movements could, in some circumstances, limit the effectiveness of JPMorgan Chase’s risk management strategies, causing it to incur losses.

JPMorgan Chase could recognize unexpected losses, its capital levels could be reduced and it could face greater regulatory scrutiny if its models, estimations or judgments, including those used in its financial statements, prove to be inadequate or incorrect.

JPMorgan Chase has developed and uses a variety of models and other analytical and judgment-based estimations to measure, monitor and implement controls over its market, credit, capital, liquidity, operational and other risks. JPMorgan Chase also uses internal models and estimations as a basis for its stress testing and in connection with the preparation of its financial statements under U.S. generally accepted accounting principles (“U.S. GAAP”).

These models and estimations are based on a variety of assumptions and historical trends, and are periodically reviewed and modified as necessary. The models and estimations that JPMorgan Chase uses may not be effective in all cases to identify, observe and mitigate risk due to a variety of factors, such as:

- reliance on historical trends that may not persist in the future, including assumptions underlying the models and estimations such as correlations among certain market indicators or asset prices
- inherent limitations associated with forecasting uncertain economic and financial outcomes
- historical trend information may be incomplete, or may not be indicative of severely negative market conditions such as extreme volatility, dislocation or lack of liquidity
- sudden illiquidity in markets or declines in prices of certain loans and securities may make it more difficult to value certain financial instruments
- technology that is introduced to run models or estimations may not perform as expected, or may not be well understood by the personnel using the technology
- models and estimations may contain erroneous data, valuations, formulas or algorithms, and
- review processes may fail to detect flaws in models and estimations.

JPMorgan Chase may experience unexpected losses if models, estimates or judgments used or applied in connection with its risk management activities or the preparation of its financial statements prove to have been inadequate or incorrect. For example, where quoted market prices are not available for certain financial instruments that require a determination of their fair value, JPMorgan Chase may make fair value determinations based on internally developed models or other means which ultimately rely to some degree on management estimates and judgment.

Similarly, JPMorgan Chase establishes an allowance for expected credit losses related to its credit exposures which requires difficult, subjective and complex judgments including forecasts of how economic conditions might impair the ability of JPMorgan Chase’s borrowers and counterparties to repay their loans or other obligations. These types of estimates and judgments may not prove to be accurate due to a variety of factors, as noted above. In addition, certain models used by JPMorgan Chase as a basis for the determination of the allowance for expected credit losses experienced heightened performance risk in the economic environment during the early stages of the COVID-19 pandemic. These models are based on historical experience of internally-developed macroeconomic scenarios, and when the current and forecasted environment is significantly different from the scenarios

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underlying those models, JPMorgan Chase may need to apply a greater degree of judgment and analytics to inform any adjustments that it has made or may make to model outputs.

Some of the models and other analytical and judgment-based estimations used by JPMorgan Chase in managing risks are subject to review by, and require the approval of, JPMorgan Chase's regulators. These reviews are required before JPMorgan Chase may use those models and estimations for calculating market risk RWA, credit risk RWA and operational risk RWA under Basel III. If JPMorgan Chase's models or estimations are not approved by its regulators, it may be subject to higher capital charges, which could adversely affect its financial results or limit the ability to expand its businesses.

Lapses in controls over disclosure or financial reporting could materially affect JPMorgan Chase's profitability or reputation.

There can be no assurance that JPMorgan Chase's disclosure controls and procedures will be effective in every circumstance, or that a material weakness or significant deficiency in internal control over financial reporting will not occur. Any such lapses or deficiencies could result in inaccurate financial reporting which, in turn, could:

- materially and adversely affect JPMorgan Chase's business and results of operations or financial condition
- restrict its ability to access the capital markets
- require it to expend significant resources to correct the lapses or deficiencies
- expose it to litigation or regulatory fines, penalties or other sanctions
- harm its reputation, or
- otherwise diminish investor confidence in JPMorgan Chase.

Strategic

If JPMorgan Chase's management fails to develop and execute effective business strategies, and to anticipate changes affecting those strategies, JPMorgan Chase's competitive standing and results could suffer.

JPMorgan Chase's business strategies significantly affect its competitive standing and operations. These strategies relate to:

- the products and services that JPMorgan Chase offers
- the geographies in which it operates
- the types of clients and customers that it serves
- the businesses that it acquires or in which it invests
- the counterparties with which it does business, and
- the methods and distribution channels by which it offers products and services.

If management makes choices about these strategies and goals that prove to be incorrect, do not accurately assess the competitive landscape and industry trends, or fail to address changing regulatory and market environments or the expectations of clients, customers, investors, employees and other stakeholders, then the franchise values and growth prospects of JPMorgan Chase's businesses may suffer and its earnings could decline.

JPMorgan Chase's growth prospects also depend on management's ability to develop and execute effective business plans to address these strategic priorities, both in the near term and over longer time horizons. Management's effectiveness in this regard will affect JPMorgan Chase's ability to develop and enhance its resources, control expenses and return capital to shareholders. Each of these objectives could be adversely affected by any failure on the part of management to:

- devise effective business plans and strategies
- offer products and services that meet changing expectations of clients and customers
- allocate capital in a manner that promotes long-term stability to enable JPMorgan Chase to build and invest in market-leading businesses, even in a highly stressed environment
- allocate capital appropriately due to imprecise modeling or subjective judgments made in connection with those allocations
- appropriately address concerns of clients, customers, investors, employees and other stakeholders, including with respect to social and sustainability matters
- react quickly to changes in market conditions or market structures, or
- develop and enhance the operational, technology, risk, financial and managerial resources necessary to grow and manage JPMorgan Chase's businesses.

Furthermore, JPMorgan Chase may incur costs in connection with disposing of excess properties, premises and facilities, and those costs could be material to its results of operations in a given period.

JPMorgan Chase faces significant and increasing competition in the rapidly evolving financial services industry.

JPMorgan Chase operates in a highly competitive environment in which it must evolve and adapt to the significant changes as a result of changes in financial regulation, technological advances, increased public scrutiny and changes in economic conditions. JPMorgan Chase expects that competition in the U.S. and global financial services industry will continue to be intense. Competitors include:

- other banks and financial institutions
- trading, advisory and investment management firms

- finance companies
- technology companies, and
- other nonbank firms that are engaged in providing similar products and services.

JPMorgan Chase cannot provide assurance that the significant competition in the financial services industry will not materially and adversely affect its future results of operations.

New competitors in the financial services industry continue to emerge. For example, technological advances and the growth of e-commerce have made it possible for non-depository institutions to offer products and services that traditionally were banking products. These advances have also allowed financial institutions and other companies to provide electronic and internet-based financial solutions, including electronic securities and cryptocurrency trading, payments processing and online automated algorithmic-based investment advice. Furthermore, both financial institutions and their non-banking competitors face the risk that payments processing and other products and services, including deposits and other traditional banking products, could be significantly disrupted by the use of new technologies, such as cryptocurrencies and other applications that use secure distributed ledgers, that require no intermediation. New technologies have required and could require JPMorgan Chase to spend more to modify or adapt its products to attract and retain clients and customers or to match products and services offered by its competitors, including technology companies. In addition, new technologies may be used by customers, or breached or infiltrated by third parties, in unexpected ways, which can increase JPMorgan Chase's costs for complying with laws, rules and regulations that apply to the offering of products and services through those technologies and reduce the income that JPMorgan Chase earns from providing products and services through those technologies.

Ongoing or increased competition may put pressure on the pricing for JPMorgan Chase's products and services or may cause JPMorgan Chase to lose market share, particularly with respect to traditional banking products. This competition may be on the basis of quality and variety of products and services offered, transaction execution, innovation, reputation and price. The failure of any of JPMorgan Chase's businesses to meet the expectations of clients and customers, whether due to general market conditions, under-performance, a decision not to offer a particular product or service, changes in client and customer expectations or other factors, could affect JPMorgan Chase's ability to attract or retain clients and customers. Any such impact could, in turn, reduce JPMorgan Chase's revenues. Increased competition also may require JPMorgan Chase to make additional capital investments in its businesses, or to extend more of its capital on behalf of its clients in order to remain competitive.

The effects of climate change could adversely impact JPMorgan Chase and its clients.

JPMorgan Chase operates in many regions, countries and communities around the world where its businesses, and the activities of its clients and customers, could be impacted by climate change. Climate change could manifest as a financial risk to JPMorgan Chase either through changes in the physical climate or from the process of transitioning to a low-carbon economy, including changes in climate policy or in the regulation of financial institutions with respect to risks posed by climate change.

Climate-related physical risks include acute weather events, such as hurricanes and floods, and chronic shifts in the climate, such as altered distribution and intensity of rainfall, prolonged droughts or flooding, increased frequency of wildfires, rising sea levels, or a rising heat index. Climate-related physical risks could have adverse financial and other impacts on JPMorgan Chase, both directly on its business and operations and as a result of impacts to its clients and customers, including:

- declines in asset values, including due to the destruction or degradation of property
- reduced availability of insurance
- significant interruptions to business operations, including supply chain disruption, and
- systemic changes to geographies, regional economies and sectors, and any resulting population migration or unemployment.

Transition risks arise from the process of adjusting to a low-carbon economy. In addition to possible changes in climate policy and financial regulation, potential transition risks may include economic and other changes engendered by the development of low-carbon technological advances (e.g., electric vehicles and renewable energy) and/or changes in consumer preferences towards low-carbon goods and services. Transition risks could be further accelerated by the occurrence of changes in the physical climate. The possible adverse impacts of transition risks to both JPMorgan Chase and its clients and customers include:

- sudden devaluation of assets, including unanticipated write-downs ("stranded assets")
- increased operational and compliance costs driven by changes in climate policy and/or regulations
- negative consequences to business models, and the need to make changes in response to those consequences, and
- damage to JPMorgan Chase's reputation, including as a result of any perception that its business practices are contrary to public policy or stakeholder preferences.

Both physical risks and transition risks could have negative impacts on the revenues, financial condition or creditworthiness of JPMorgan's clients and customers, and on its exposure to those clients and customers.

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Conduct

Conduct failure by JPMorgan Chase employees can harm clients and customers, impact market integrity, damage JPMorgan Chase's reputation and trigger litigation and regulatory action.

JPMorgan Chase's employees interact with clients, customers and counterparties, and with each other, every day. All employees are expected to demonstrate values and exhibit the behaviors that are an integral part of JPMorgan Chase's Code of Conduct and How We Do Business Principles, including JPMorgan Chase's commitment to "do first class business in a first class way." JPMorgan Chase endeavors to embed conduct risk management throughout an employee's life cycle, including recruiting, onboarding, training and development, and performance management. Conduct risk management is also an integral component of JPMorgan Chase's promotion and compensation processes.

Notwithstanding these expectations, policies and practices, certain employees have engaged in improper or illegal conduct in the past. These instances of misconduct have resulted in litigation, and resolutions of governmental investigations or enforcement actions involving consent orders, deferred prosecution agreements, non-prosecution agreements and other civil or criminal sanctions. There is no assurance that further inappropriate or unlawful actions by employees will not occur, lead to a violation of the terms of these resolutions (and associated consequences), or that any such actions will always be detected, deterred or prevented.

JPMorgan Chase's reputation could be harmed, and collateral consequences could result, from a failure by one or more employees to conduct themselves in accordance with JPMorgan Chase's expectations, policies and practices, including by acting in ways that harm clients, customers, other market participants or other employees. Some examples of this include:

- improperly selling and marketing JPMorgan Chase's products or services
- engaging in insider trading, market manipulation or unauthorized trading
- engaging in improper or fraudulent behavior in connection with government relief programs
- facilitating a transaction where a material objective is to achieve a particular tax, accounting or financial disclosure treatment that may be subject to scrutiny by governmental or regulatory authorities, or where the proposed treatment is unclear or may not reflect the economic substance of the transaction
- failing to fulfill fiduciary obligations or other duties owed to clients or customers
- violating antitrust or anti-competition laws by colluding with other market participants

- using electronic communications channels that have not been approved by JPMorgan Chase
- engaging in discriminatory behavior or harassment with respect to clients, customers or employees, or acting contrary to JPMorgan Chase's goal of fostering a diverse and inclusive workplace
- managing or reporting risks in ways that subordinate JPMorgan Chase's risk appetite to business performance goals or employee compensation objectives, and
- misappropriating property, confidential or proprietary information, or technology assets belonging to JPMorgan Chase, its clients and customers or third parties.

The consequences of any failure by one or more employees to conduct themselves in accordance with JPMorgan Chase's expectations, policies or practices could include litigation, or regulatory or other governmental investigations or enforcement actions. Any of these proceedings or actions could result in judgments, settlements, fines, penalties or other sanctions, or lead to:

- financial losses
- increased operational and compliance costs
- greater scrutiny by regulators and other parties
- regulatory actions that require JPMorgan Chase to restructure, curtail or cease certain of its activities
- the need for significant oversight by JPMorgan Chase's management
- loss of clients or customers, and
- harm to JPMorgan Chase's reputation.

The foregoing risks could be heightened with respect to newly-acquired businesses if JPMorgan Chase fails to successfully integrate employees of those businesses or any of those employees do not conduct themselves in accordance with JPMorgan Chase's expectations, policies and practices.

Reputation

Damage to JPMorgan Chase's reputation could harm its businesses.

Maintaining trust in JPMorgan Chase is critical to its ability to attract and retain clients, customers, investors and employees. Damage to JPMorgan Chase's reputation can therefore cause significant harm to JPMorgan Chase's business and prospects, and can arise from numerous sources, including:

- employee misconduct, including discriminatory behavior or harassment with respect to clients, customers or employees, or actions that are contrary to JPMorgan Chase's goal of fostering a diverse and inclusive workplace

- security breaches, including as a result of cyber attacks
- failure to safeguard client, customer or employee information
- failure to manage risks associated with its business activities or those of its clients, including those that may be unpopular among one or more constituencies
- failure to fully discharge publicly-announced commitments to support social and sustainability initiatives
- non-compliance with laws, rules, and regulations
- operational failures
- litigation or regulatory fines, penalties or other sanctions
- actions taken in executing regulatory and governmental requirements during a global or regional health emergency
- regulatory investigations or enforcement actions, or resolutions of these matters, and
- failure or perceived failure to comply with laws, rules or regulations by JPMorgan Chase or its clients, customers, counterparties or other parties, including newly-acquired businesses, companies in which JPMorgan Chase has made principal investments, parties to joint ventures with JPMorgan Chase, and vendors with which JPMorgan Chase does business.

JPMorgan Chase's reputation may be significantly damaged by adverse publicity or negative information regarding JPMorgan Chase, whether or not true, that may be published or broadcast by the media or posted on social media, non-mainstream news services or other parts of the internet. This latter risk can be magnified by the speed and pervasiveness with which information is disseminated through those channels.

Social and environmental activists are increasingly targeting financial services firms such as JPMorgan Chase with public criticism for their relationships with clients that are engaged in certain sensitive industries, including businesses whose products are or are perceived to be harmful to human health, or whose activities negatively affect or are perceived to negatively affect the environment, workers' rights or communities. Activists have also engaged in public protests at JPMorgan Chase's headquarters and other properties. Activist criticism of JPMorgan Chase's relationships with clients in sensitive industries could potentially engender dissatisfaction among clients, customers, investors and employees with how JPMorgan Chase addresses social and sustainability concerns in its business activities. Alternatively, yielding to activism targeted at certain sensitive industries could damage JPMorgan Chase's relationships with clients and customers, and with governmental or regulatory bodies in jurisdictions in which JPMorgan Chase does business, whose views are not aligned with those of social and

environmental activists. In either case, the resulting harm to JPMorgan Chase's reputation could:

- cause certain clients and customers to cease doing business with JPMorgan Chase
- impair JPMorgan Chase's ability to attract new clients and customers, or to expand its relationships with existing clients and customers
- diminish JPMorgan Chase's ability to hire or retain employees
- prompt JPMorgan Chase to cease doing business with certain clients or customers.
- cause certain investors to divest from investments in securities of JPMorgan Chase, or
- attract scrutiny from governmental or regulatory bodies.

Actions by the financial services industry generally or individuals in the industry can also affect JPMorgan Chase's reputation. For example, the reputation of the industry as a whole can be damaged by concerns that:

- consumers have been treated unfairly by a financial institution, or
- a financial institution has acted inappropriately with respect to the methods used to offer products to customers

If JPMorgan Chase is perceived to have engaged in these types of behaviors, this could weaken its reputation among clients or customers.

Failure to effectively manage potential conflicts of interest or to satisfy fiduciary obligations can result in litigation and enforcement actions, as well as damage JPMorgan Chase's reputation.

JPMorgan Chase's ability to manage potential conflicts of interest is highly complex due to the broad range of its business activities which encompass a variety of transactions, obligations and interests with and among JPMorgan Chase's clients and customers. JPMorgan Chase can become subject to litigation and enforcement actions, and its reputation can be damaged, by the failure or perceived failure to:

- adequately address or appropriately disclose conflicts of interest, including potential conflicts of interest that may arise in connection with providing multiple products and services in, or having one or more investments related to, the same transaction
- deliver appropriate standards of service and quality
- treat clients and customers with the appropriate standard of care
- use client and customer data responsibly and in a manner that meets legal requirements and regulatory expectations

Part I

- provide fiduciary products or services in accordance with the applicable legal and regulatory standards, or
- handle or use confidential information of customers or clients appropriately or in compliance with applicable data protection and privacy laws, rules and regulations.

A failure or perceived failure to appropriately address conflicts of interest or fiduciary obligations could result in customer dissatisfaction, litigation and regulatory fines, penalties or other sanctions, and heightened regulatory scrutiny and enforcement actions, all of which can lead to lost revenue and higher operating costs and cause serious harm to JPMorgan Chase's reputation.

Country

An outbreak or escalation of hostilities between countries or within a country or region could have a material adverse effect on the global economy and on JPMorgan Chase's businesses within the affected region or globally.

Aggressive actions by hostile governments or groups, including armed conflict or intensified cyber attacks, could expand in unpredictable ways by drawing in other countries or escalating into full-scale war with potentially catastrophic consequences, particularly if one or more of the combatants possess nuclear weapons. Depending on the scope of the conflict, the hostilities could result in:

- worldwide economic disruption
- heightened volatility in financial markets
- severe declines in asset values, accompanied by widespread sell-offs of investments
- substantial depreciation of local currencies, potentially leading to defaults by borrowers and counterparties in the affected region
- disruption of global trade, and
- diminished consumer, business and investor confidence.

Any of the above consequences could have significant negative effects on JPMorgan Chase's operations and earnings, both in the countries or regions directly affected by the hostilities or globally. Further, if the U.S. were to become directly involved in such a conflict, this could lead to a curtailment of any operations that JPMorgan Chase may have in the affected countries or region, as well as in any nation that is aligned against the U.S. in the hostilities. JPMorgan Chase could also experience more numerous and aggressive cyber attacks launched by or under the sponsorship of one or more of the adversaries in such a conflict.

JPMorgan Chase's business and operations in certain countries can be adversely affected by local economic, political, regulatory and social factors.

Some of the countries in which JPMorgan Chase conducts business have economies or markets that are less developed and more volatile or may have political, legal and

regulatory regimes that are less established or predictable than other countries in which JPMorgan Chase operates. In addition, in some jurisdictions in which JPMorgan Chase conducts business, the local economy and business activity are subject to substantial government influence or control. Some of these countries have in the past experienced economic disruptions, including:

- extreme currency fluctuations
- high inflation
- low or negative growth, and
- defaults or reduced ability to service sovereign debt.

The governments in these countries have sometimes reacted to these developments by imposing restrictive policies that adversely affect the local and regional business environment, such as:

- price, capital or exchange controls, including imposition of punitive transfer and convertibility restrictions or forced currency exchange
- expropriation or nationalization of assets or confiscation of property, including intellectual property, and
- changes in laws, rules and regulations.

The impact of these actions could be accentuated in trading markets that are smaller, less liquid and more volatile than more-developed markets. These types of government actions can negatively affect JPMorgan Chase's operations in the relevant country, either directly or by suppressing the business activities of local clients or multi-national clients that conduct business in the jurisdiction.

In addition, emerging markets countries, as well as certain more developed countries, have been susceptible to unfavorable social developments arising from poor economic conditions or governmental actions, including:

- widespread demonstrations, civil unrest or general strikes
- crime and corruption
- security and personal safety issues
- an outbreak or escalation of hostilities
- overthrow of incumbent governments
- terrorist attacks, and
- other forms of internal discord.

These economic, political, regulatory and social developments have in the past resulted in, and in the future could lead to, conditions that can adversely affect JPMorgan Chase's operations in those countries and impair the revenues, growth and profitability of those operations. In addition, any of these events or circumstances in one country can affect JPMorgan Chase's operations and investments in another country or countries, including in the U.S.

People

JPMorgan Chase's ability to attract and retain qualified and diverse employees is critical to its success.

JPMorgan Chase's employees are its most important resource, and in many areas of the financial services industry, competition for qualified personnel is intense. JPMorgan Chase endeavors to attract talented and diverse new employees and retain, develop and motivate its existing employees. JPMorgan Chase's efforts to retain talented and diverse employees can be particularly challenging when members of its workforce are targeted for recruitment by competitors. If JPMorgan Chase were unable to continue to attract or retain qualified and diverse employees, including successors to the Chief Executive Officer, members of the Operating Committee and other senior leaders, JPMorgan Chase's performance, including its competitive position, could be materially and adversely affected.

Unfavorable changes in immigration or travel policies could adversely affect JPMorgan Chase's businesses and operations.

JPMorgan Chase relies on the skills, knowledge and expertise of employees located throughout the world. Changes in immigration or travel policies in the U.S. and other countries that unduly restrict or otherwise make it more difficult for employees or their family members to work in, or travel to or transfer between, jurisdictions in which JPMorgan Chase has operations or conducts its business could inhibit JPMorgan Chase's ability to attract and retain qualified employees, and thereby dilute the quality of its workforce, or could prompt JPMorgan Chase to make structural changes to its worldwide or regional operating models that cause its operations to be less efficient or more costly.

Legal

JPMorgan Chase faces significant legal risks from litigation and formal and informal regulatory and government investigations.

JPMorgan Chase is named as a defendant or is otherwise involved in many legal proceedings, including class actions and other litigation or disputes with third parties. Actions currently pending against JPMorgan Chase may result in judgments, settlements, fines, penalties or other sanctions adverse to JPMorgan Chase. Any of these matters could materially and adversely affect JPMorgan Chase's business, financial condition or results of operations, or cause serious reputational harm. As a participant in the financial services industry, it is likely that JPMorgan Chase will continue to experience a high level of litigation and regulatory and government investigations related to its businesses and operations.

Regulators and other government agencies conduct examinations of JPMorgan Chase and its subsidiaries both on a routine basis and in targeted exams, and JPMorgan Chase's businesses and operations are subject to

heightened regulatory oversight. This heightened regulatory scrutiny, or the results of such an investigation or examination, may lead to additional regulatory investigations or enforcement actions. There is no assurance that those actions will not result in resolutions or other enforcement actions against JPMorgan Chase. Furthermore, a single event involving a potential violation of law or regulation may give rise to numerous and overlapping investigations and proceedings, either by multiple federal, state or local agencies and officials in the U.S. or, in some instances, regulators and other governmental officials in non-U.S. jurisdictions.

If another financial institution violates a law or regulation relating to a particular business activity or practice, this will often give rise to an investigation by regulators and other governmental agencies of the same or similar activity or practice by JPMorgan Chase.

These and other initiatives by U.S. and non-U.S. governmental authorities may subject JPMorgan Chase to judgments, settlements, fines, penalties or other sanctions, and may require JPMorgan Chase to restructure its operations and activities or to cease offering certain products or services. All of these potential outcomes could harm JPMorgan Chase's reputation or lead to higher operational costs, thereby reducing JPMorgan Chase's profitability, or result in collateral consequences. In addition, the extent of JPMorgan Chase's exposure to legal and regulatory matters can be unpredictable and could, in some cases, exceed the amount of reserves that JPMorgan Chase has established for those matters.

Parts I and II

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

JPMorgan Chase's headquarters is located in New York City at 383 Madison Avenue, a 47-story office building that it owns. The demolition of the Firm's former headquarters at 270 Park Avenue in New York City was completed in 2021, and construction of a new headquarters on the same site has commenced.

The Firm owned or leased facilities in the following locations at December 31, 2021.

December 31, 2021 (in millions)	Approximate square footage
United States^(a)	
New York City, New York	
383 Madison Avenue, New York, New York	1.1
All other New York City locations	7.6
Total New York City, New York	8.7
Other U.S. locations	
Columbus/Westerville, Ohio	3.7
Chicago, Illinois	2.7
Wilmington/Newark, Delaware	2.2
Dallas/Plano, Texas	2.1
Jersey City, New Jersey	1.8
Phoenix/Tempe, Arizona	1.7
Houston, Texas	1.7
All other U.S. locations	34.5
Total United States	59.1
Europe, the Middle East and Africa ("EMEA")	
25 Bank Street, London, U.K.	1.4
All other U.K. locations	2.7
All other EMEA locations	1.4
Total EMEA	5.5
Asia-Pacific, Latin America and Canada	
India	5.3
All other locations	3.9
Total Asia-Pacific, Latin America and Canada	9.2
Total	73.8

(a) At December 31, 2021, the Firm owned or leased 4,790 retail branches in 48 states and Washington D.C.

The premises and facilities occupied by JPMorgan Chase are used across all of the Firm's business segments and for corporate purposes. JPMorgan Chase continues to evaluate its current and projected space requirements and may determine from time to time that certain of its properties (including the premises and facilities noted above) are no longer necessary for its operations. There is no assurance that the Firm will be able to dispose of any such excess properties, premises or facilities, or that it will not incur costs in connection with such dispositions. Such disposition costs may be material to the Firm's results of operations in a given period. Refer to the Consolidated Results of

Operations on pages 52-54 for information on occupancy expense.

Item 3. Legal Proceedings.

Refer to Note 30 for a description of the Firm's material legal proceedings.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market for registrant’s common equity

JPMorgan Chase’s common stock is listed and traded on the New York Stock Exchange. Refer to “Five-year stock performance,” on page 45 for a comparison of the cumulative total return for JPMorgan Chase common stock with the comparable total return of the S&P 500 Index, the KBW Bank Index and the S&P Financial Index over the five-year period ended December 31, 2021.

Refer to Capital actions in the Capital Risk Management section of Management’s discussion and analysis on page 94 for information on the common dividend payout ratio. Refer to Note 21 for a discussion of restrictions on dividend payments. On January 31, 2022, there were 199,031 holders of record of JPMorgan Chase common stock. Refer to Part III, Item 12 on page 38 for information regarding securities authorized for issuance under the Firm’s employee share-based incentive plans.

Repurchases under the common share repurchase program

Refer to Capital actions in the Capital Risk Management section of Management’s discussion and analysis on page 94 for information regarding repurchases under the Firm’s common share repurchase program.

On December 18, 2020, the Federal Reserve announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021. Subsequently, the Firm announced that its Board of Directors authorized a new common share repurchase program for up to \$30 billion. As directed by the Federal Reserve, total net repurchases and common stock dividends in the first and second quarters of 2021 were restricted and could not exceed the average of the Firm’s net income for the four preceding calendar quarters.

On June 24, 2021, the Federal Reserve announced that the temporary restrictions on capital distributions would expire on June 30, 2021 as a result of the Firm remaining above its minimum risk-based capital requirements under the 2021 CCAR stress test. Effective July 1, 2021, the Firm became subject to the normal capital distribution restrictions provided under the regulatory capital framework. The Firm continues to be authorized to repurchase common shares under its existing common share repurchase program previously approved by the Board of Directors.

Shares repurchased pursuant to the common share repurchase program during 2021 were as follows.

Year ended December 31, 2021	Total number of shares of common stock repurchased	Average price paid per share of common stock ^(a)	Aggregate purchase price of common stock repurchases (in millions) ^(a)	Dollar value of remaining authorized repurchase (in millions) ^{(a)(b)}
First quarter	34,652,594	\$ 144.25	\$ 4,999	\$ 25,001
Second quarter	39,544,940	156.83	6,201	18,800
Third quarter	33,400,817	156.87	5,240	13,560
October	6,840,122	167.89	1,148	12,412
November	2,528,754	166.08	420	11,992
December	2,769,076	158.94	440	11,552
Fourth quarter	12,137,952	165.47	2,008	11,552
Year-to-date	119,736,303	\$ 154.08	\$ 18,448	\$ 11,552

(a) Excludes commissions cost.

(b) Represents the amount remaining under the \$30 billion repurchase program.

Item 6. Reserved

Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations.

Management’s discussion and analysis of financial condition and results of operations, entitled “Management’s discussion and analysis,” appears on pages 46-154. Such information should be read in conjunction with the Consolidated Financial Statements and Notes thereto, which appear on pages 160-298.

Parts II and III

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Refer to the Market Risk Management section of Management's discussion and analysis on pages 133-140 for a discussion of quantitative and qualitative disclosures about market risk.

Item 8. Financial Statements and Supplementary Data.

The Consolidated Financial Statements, together with the Notes thereto and the report thereon dated February 22, 2022, of PricewaterhouseCoopers LLP, the Firm's independent registered public accounting firm (PCAOB ID 238), appear on pages 157-298.

The "Glossary of Terms and Acronyms" is included on pages 305-311.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

The internal control framework promulgated by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"), "Internal Control – Integrated Framework" ("COSO 2013"), provides guidance for designing, implementing and conducting internal control and assessing its effectiveness. The Firm used the COSO 2013 framework to assess the effectiveness of the Firm's internal control over financial reporting as of December 31, 2021. Refer to "Management's report on internal control over financial reporting" on page 156.

As of the end of the period covered by this report, an evaluation was carried out under the supervision and with the participation of the Firm's management, including its Chairman and Chief Executive Officer and its Chief Financial Officer, of the effectiveness of its disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934). Based on that evaluation, the Chairman and Chief Executive Officer and the Chief Financial Officer concluded that these disclosure controls and procedures were effective. Refer to Exhibits 31.1 and 31.2 for the Certifications furnished by the Chairman and Chief Executive Officer and Chief Financial Officer, respectively.

The Firm is committed to maintaining high standards of internal control over financial reporting. Nevertheless, because of its inherent limitations, internal control over financial reporting may not prevent or detect all misstatements. Deficiencies or lapses in internal controls may occur from time to time, and there can be no assurance that any such deficiencies will not result in significant deficiencies or material weaknesses in internal control in the future and collateral consequences

therefrom. Refer to "Management's report on internal control over financial reporting" on page 156 for further information. There was no change in the Firm's internal control over financial reporting (as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934) that occurred during the three months ended December 31, 2021, that has materially affected, or is reasonably likely to materially affect, the Firm's internal control over financial reporting.

Item 9B. Other Information.

None.

Item 9C. Disclosure regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

Item 10. Directors, Executive Officers and Corporate Governance.

Executive officers of the registrant

Name	Age (at December 31, 2021)	Positions and offices
James Dimon	65	Chairman of the Board and Chief Executive Officer; he had been President from July 2004 until January 2018.
Ashley Bacon	52	Chief Risk Officer since June 2013.
Jeremy Barnum	49	Chief Financial Officer since May 2021, prior to which he was Head of Global Research for the Corporate & Investment Bank since February 2021. He previously served as Chief Financial Officer of the Corporate & Investment Bank from July 2013 until February 2021.
Lori A. Beer	54	Chief Information Officer since September 2017, prior to which she had been Chief Information Officer of the Corporate & Investment Bank since June 2016. She was Global Head of Banking Technology from January 2014 until May 2016.
Mary Callahan Erdoes	54	Chief Executive Officer of Asset & Wealth Management since September 2009.
Stacey Friedman	53	General Counsel since January 2016, prior to which she was Deputy General Counsel since July 2015 and General Counsel for the Corporate & Investment Bank since August 2012.
Marianne Lake	52	Co-Chief Executive Officer of Consumer & Community Banking since May 2021, prior to which she had been Chief Executive Officer of Consumer Lending since May 2019. She was Chief Financial Officer from January 2013 until May 2019.
Robin Leopold	57	Head of Human Resources since January 2018, prior to which she had been Head of Human Resources for the Corporate & Investment Bank since August 2012.
Douglas B. Petno	56	Chief Executive Officer of Commercial Banking since January 2012.
Jennifer Piepszak	51	Co-Chief Executive Officer of Consumer & Community Banking since May 2021, prior to which she had been Chief Financial Officer since May 2019. She previously served as Chief Executive Officer for Card Services from February 2017 until May 2019 and Chief Executive Officer of Business Banking from March 2015 to January 2017.
Daniel E. Pinto ^(a)	59	President and Chief Operating Officer since January 1, 2022 and Chief Executive Officer of the Corporate & Investment Bank since March 2014, having previously served as Co-President and Co-Chief Operating Officer since January 2018. He was Chief Executive Officer of Europe, the Middle East and Africa from June 2011 until October 2017.
Peter Scher	60	Vice Chairman since March 2021 and Chairman of the Mid-Atlantic Region since February 2015. He previously served as Head of Corporate Responsibility from April 2011 until September 2021.

Unless otherwise noted, during the five fiscal years ended December 31, 2021, all of JPMorgan Chase's above-named executive officers have continuously held senior-level positions with JPMorgan Chase. There are no family relationships among the foregoing executive officers. Information to be provided in Items 10, 11, 12, 13 and 14 of this 2021 Form 10-K and not otherwise included herein is incorporated by reference to the Firm's Definitive Proxy Statement for its 2022 Annual Meeting of Stockholders to be held on May 17, 2022, which will be filed with the SEC within 120 days of the end of the Firm's fiscal year ended December 31, 2021.

(a) Effective January 1, 2022, Mr. Pinto became the Firm's sole President and Chief Operating Officer, following the retirement of Gordon A. Smith as Co-President, Co-Chief Operating Officer and Chief Executive Officer of Consumer & Community Banking on December 31, 2021; Mr. Smith is no longer an executive officer of the Firm.

Parts III and IV

Item 11. Executive Compensation.

Refer to Item 10.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

Refer to Item 10 for security ownership of certain beneficial owners and management.

The following table sets forth the total number of shares available for issuance under JPMorgan Chase's employee share-based incentive plans (including shares available for issuance to non-employee directors). The Firm is not authorized to grant share-based incentive awards to non-employees, other than to non-employee directors.

December 31, 2021	Number of shares to be issued upon exercise of outstanding options/stock appreciation rights	Weighted-average exercise price of outstanding options/stock appreciation rights	Number of shares remaining available for future issuance under stock incentive plans
Plan category			
Employee share-based incentive plans approved by shareholders	3,369,348 ^(a)	\$ 116.62	82,749,985 ^(b)
Total	3,369,348	\$ 116.62	82,749,985

(a) Does not include restricted stock units or performance stock units granted under the shareholder-approved Long-Term Incentive Plan ("LTIP"), as amended and restated effective May 18, 2021. Refer to Note 9 for further discussion.

(b) Represents shares available for future issuance under the shareholder-approved LTIP.

All shares available for future issuance will be issued under the shareholder-approved LTIP. Refer to Note 9 for further discussion.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

Refer to Item 10.

Item 14. Principal Accounting Fees and Services.

Refer to Item 10.

Item 15. Exhibits, Financial Statement Schedules.		3.8	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series V (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed on June 9, 2014).
1	Financial statements		
	The Consolidated Financial Statements, the Notes thereto and the report of the Independent Registered Public Accounting Firm thereon listed in Item 8 are set forth commencing on page 157.	3.9	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series X (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed on September 23, 2014).
2	Financial statement schedules		
3	Exhibits		
3.1	Restated Certificate of Incorporation of JPMorgan Chase & Co., effective April 5, 2006 (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed April 7, 2006).	3.10	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series CC (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed October 20, 2017).
3.2	Amendment to the Restated Certificate of Incorporation of JPMorgan Chase & Co., effective June 7, 2013 (incorporated by reference to Appendix F to the Proxy Statement on Schedule 14A of JPMorgan Chase & Co. (File No. 1-5805) filed April 10, 2013).	3.11	Certificate of Designations for 5.75% Non-Cumulative Preferred Stock, Series DD (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed September 21, 2018).
3.3	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series I (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed April 24, 2008).	3.12	Certificate of Designations for 6.00% Non-Cumulative Preferred Stock, Series EE (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 24, 2019).
3.4	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series Q (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed April 23, 2013).	3.13	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series FF (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed July 31, 2019).
3.5	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series R (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed July 29, 2013).	3.14	Certificate of Designations for 4.75% Non-Cumulative Preferred Stock, Series GG (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed November 7, 2019).
3.6	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series S (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 22, 2014).	3.15	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series HH (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 23, 2020).
3.7	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series U (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed on March 10, 2014).	3.16	Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series II (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed February 24, 2020).
		3.17	Certificate of Designations for 4.55% Non-Cumulative Preferred Stock, Series JJ (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed March 17, 2021).

Part IV

- 3.18 [Certificate of Designations for 3.65% Fixed-Rate Reset Non-Cumulative Preferred Stock, Series KK \(incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No. 1-5805\) filed May 12, 2021\).](#)
- 3.19 [Certificate of Designations for 4.625% Non-Cumulative Preferred Stock, Series LL \(incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No. 1-5805\) filed May 20, 2021\).](#)
- 3.20 [Certificate of Designations for 4.20% Non-Cumulative Preferred Stock, Series MM \(incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No. 1-5805\) filed July 29, 2021\).](#)
- 3.21 [By-laws of JPMorgan Chase & Co., as amended, effective January 30, 2018 \(incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No. 1-5805\) filed January 30, 2018\).](#)
- 4.1(a) [Indenture, dated as of October 21, 2010, between JPMorgan Chase & Co. and Deutsche Bank Trust Company Americas, as Trustee \(incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No.1-5805\) filed October 21, 2010\).](#)
- 4.1(b) [First Supplemental Indenture, dated as of January 13, 2017, between JPMorgan Chase & Co. and Deutsche Bank Trust Company Americas, as Trustee, to the Indenture, dated as of October 21, 2010 \(incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No. 1-5805\) filed January 13, 2017\).](#)
- 4.2(a) [Subordinated Indenture, dated as of March 14, 2014, between JPMorgan Chase & Co. and U.S. Bank Trust National Association, as Trustee \(incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No.1-5805\) filed March 14, 2014\).](#)
- 4.2(b) [First Supplemental Indenture, dated as of January 13, 2017, between JPMorgan Chase & Co. and U.S. Bank Trust National Association, as Trustee, to the Subordinated Indenture, dated as of March 14, 2014 \(incorporated by reference to Exhibit 4.2 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No. 1-5805\) filed January 13, 2017\).](#)
- 4.3(a) [Indenture, dated as of May 25, 2001, between JPMorgan Chase & Co. and Bankers Trust Company \(succeeded by Deutsche Bank Trust Company Americas\), as Trustee \(incorporated by reference to Exhibit 4\(a\)\(1\) to the Registration Statement on Form S-3 of JPMorgan Chase & Co. \(File No. 333-52826\) filed June 13, 2001\).](#)
- 4.3(b) [Sixth Supplemental Indenture, dated as of January 13, 2017, between JPMorgan Chase & Co. and Bankers Trust Company \(succeeded by Deutsche Bank Trust Company Americas\), as Trustee, to the Indenture, dated as of May 25, 2001 \(incorporated by reference to Exhibit 4.3 to the Current Report on Form 8-K of JPMorgan Chase & Co. \(File No. 1-5805\) filed January 13, 2017\).](#)
- 4.4 [Indenture, dated as of February 19, 2016, among JPMorgan Chase Financial Company LLC, JPMorgan Chase & Co. and Deutsche Bank Trust Company Americas, as Trustee \(incorporated by reference to Exhibit 4\(a\)\(7\) to the Registration Statement on Form S-3 of JPMorgan Chase & Co. and JPMorgan Chase Financial Company LLC \(File No. 333-209682\) filed February 24, 2016\).](#)
- 4.5 [Form of Deposit Agreement \(incorporated by reference to Exhibit 4.3 to the Registration Statement on Form S-3 of JPMorgan Chase & Co. \(File No. 333-191692\) filed October 11, 2013\).](#)
- 4.6 [Description of Securities of JPMorgan Chase & Co. registered pursuant to Section 12 of the Securities Exchange Act of 1934.^{\(b\)}](#)
- Other instruments defining the rights of holders of long-term debt securities of JPMorgan Chase & Co. and its subsidiaries are omitted pursuant to Section (b)(4)(iii)(A) of Item 601 of Regulation S-K. JPMorgan Chase & Co. agrees to furnish copies of these instruments to the SEC upon request.*
- 10.1 [Deferred Compensation Plan for Non-Employee Directors of JPMorgan Chase & Co., as amended and restated July 2001 and as of December 31, 2004 \(incorporated by reference to Exhibit 10.1 to the Annual Report on Form 10-K of JPMorgan Chase & Co. \(File No. 1-5805\) for the year ended December 31, 2007\).^{\(a\)}](#)
- 10.2 [2005 Deferred Compensation Plan for Non-Employee Directors of JPMorgan Chase & Co., effective as of January 1, 2005 \(incorporated by reference to Exhibit 10.2 to the Annual Report on Form 10-K of JPMorgan Chase & Co. \(File No. 1-5805\) for the year ended December 31, 2007\).^{\(a\)}](#)
- 10.3 [2005 Deferred Compensation Program of JPMorgan Chase & Co., restated effective as of December 31, 2008 \(incorporated by reference to Exhibit 10.4 to the Annual Report on Form 10-K of JPMorgan Chase & Co. \(File No. 1-5805\) for the year ended December 31, 2008\).^{\(a\)}](#)
- 10.4 [JPMorgan Chase & Co. Amended and Restated Long-Term Incentive Plan, effective May 18, 2021 \(incorporated by reference to the Appendix of the Schedule 14A of JPMorgan Chase & Co. \(File No. 1-5805\) filed April 7, 2021\).^{\(a\)}](#)

10.5	<u>Key Executive Performance Plan of JPMorgan Chase & Co., as amended and restated effective January 1, 2014 (incorporated by reference to Appendix G of the Schedule 14A of JPMorgan Chase & Co. (File No. 1-5805) filed April 10, 2013).</u> ^(a)	10.13	<u>Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for restricted stock units for Operating Committee members (U.S. and U.K.), dated as of January 15, 2019 (incorporated by reference to Exhibit 10.18 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2018).</u> ^(a)
10.6	<u>Excess Retirement Plan of JPMorgan Chase & Co., restated and amended as of December 31, 2008, as amended (incorporated by reference to Exhibit 10.7 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2009).</u> ^(a)	10.14	<u>Form of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions of Performance Share Unit Award Operating Committee (U.S.) (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed March 15, 2019).</u> ^(a)
10.7	<u>Executive Retirement Plan of JPMorgan Chase & Co., as amended and restated December 31, 2008 (incorporated by reference to Exhibit 10.9 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2008).</u> ^(a)	10.15	<u>Form of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions of Performance Share Unit Award Operating Committee (U.K.) (incorporated by reference to Exhibit 10.2 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed March 15, 2019).</u> ^(a)
10.8	<u>Bank One Corporation Supplemental Savings and Investment Plan, as amended and restated effective December 31, 2008 (incorporated by reference to Exhibit 10.13 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2008).</u> ^(a)	10.16	<u>Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for restricted stock units and performance share unit awards for Operating Committee members (U.S. and U.K.), dated as of January 21, 2020 (incorporated by reference to Exhibit 10.18 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2019).</u> ^(a)
10.9	<u>Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for stock appreciation rights and restricted stock units, dated as of January 18, 2012 (incorporated by reference to Exhibit 10.25 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2011).</u> ^(a)	10.17	<u>Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for restricted stock units and performance share unit awards for Operating Committee members (U.S. and U.K.), dated as of January 19, 2021 (incorporated by reference to Exhibit 10.17 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2020).</u> ^(a)
10.10	<u>Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for stock appreciation rights and restricted stock units for Operating Committee members, dated as of January 17, 2013 (incorporated by reference to Exhibit 10.23 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2012).</u> ^(a)	10.18	<u>Form of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for stock appreciation rights for Chairman/Chief Executive Officer, dated July 20, 2021 (incorporated by reference to Exhibit 99 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed July 20, 2021).</u> ^(a)
10.11	<u>Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for performance share units and restricted stock units for Operating Committee members (U.S. and U.K.), dated as of January 17, 2017 (incorporated by reference to Exhibit 10.23 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2016).</u> ^(a)	10.19	<u>Form of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for stock appreciation rights for President and Chief Operating Officer, dated December 14, 2021 (incorporated by reference to Exhibit 99 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed December 15, 2021).</u> ^(a)
10.12	<u>Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for performance share units and restricted stock units for Operating Committee members (U.S. and U.K.), dated as of January 16, 2018 (incorporated by reference to Exhibit 10.19 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2017).</u> ^(a)		

Part IV

10.20	Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for restricted stock units and performance share unit awards for Operating Committee members (U.S. and U.K.), dated as of January 18, 2022. ^{(a)(b)}	104	Cover Page Interactive Data File (embedded within the Inline XBRL document and included in Exhibit 101).
10.21	Form of JPMorgan Chase & Co. Terms and Conditions of Fixed Allowance (UK) (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q of JPMorgan Chase & Co. (File No. 1-5805) for the quarter ended June 30, 2014). ^(a)		
10.22	Employee Stock Purchase Plan of JPMorgan Chase & Co., as amended and restated effective as of January 1, 2019 (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q of JPMorgan Chase & Co. (File No. 1-5805) for the quarter ended September 30, 2019).		
10.23	Form of JPMorgan Chase & Co. Performance-Based Incentive Compensation Plan, effective as of January 1, 2021, as amended. ^{(a)(b)}		
21	List of subsidiaries of JPMorgan Chase & Co. ^(b)		
22.1	Annual Report on Form 11-K of The JPMorgan Chase 401(k) Savings Plan for the year ended December 31, 2019 (to be filed pursuant to Rule 15d-21 under the Securities Exchange Act of 1934).		
22.2	Subsidiary Guarantors and Issuers of Guaranteed Securities. ^(b)		
23	Consent of independent registered public accounting firm. ^(b)		
31.1	Certification. ^(b)		
31.2	Certification. ^(b)		
32	Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002. ^(c)		
101.INS	The instance document does not appear in the interactive data file because its XBRL tags are embedded within the Inline XBRL document. ^(d)		
101.SCH	XBRL Taxonomy Extension Schema Document. ^(b)		
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document. ^(b)		
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document. ^(b)		
101.LAB	XBRL Taxonomy Extension Label Linkbase Document. ^(b)		
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document. ^(b)		

-
- (a) This exhibit is a management contract or compensatory plan or arrangement.
- (b) Filed herewith.
- (c) Furnished herewith. This exhibit shall not be deemed “filed” for purposes of Section 18 of the Securities Exchange Act of 1934, or otherwise subject to the liability of that Section. Such exhibit shall not be deemed incorporated into any filing under the Securities Act of 1933 or the Securities Exchange Act of 1934.
- (d) Pursuant to Rule 405 of Regulation S-T, includes the following financial information included in the Firm’s Form 10-K for the year ended December 31, 2021, formatted in XBRL (eXtensible Business Reporting Language) interactive data files: (i) the Consolidated statements of income for the years ended December 31, 2021, 2020 and 2019, (ii) the Consolidated statements of comprehensive income for the years ended December 31, 2021, 2020 and 2019, (iii) the Consolidated balance sheets as of December 31, 2021 and 2020, (iv) the Consolidated statements of changes in stockholders’ equity for the years ended December 31, 2021, 2020 and 2019, (v) the Consolidated statements of cash flows for the years ended December 31, 2021, 2020 and 2019, and (vi) the Notes to Consolidated Financial Statements.

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THREE-YEAR SUMMARY OF CONSOLIDATED FINANCIAL HIGHLIGHTS (unaudited)

As of or for the year ended December 31, (in millions, except per share, ratio, headcount data and where otherwise noted)	2021	2020	2019
Selected income statement data			
Total net revenue ^(a)	\$ 121,649	\$ 119,951	\$ 115,720
Total noninterest expense	71,343	66,656	65,269
Pre-provision profit^(b)	50,306	53,295	50,451
Provision for credit losses	(9,256)	17,480	5,585
Income before income tax expense	59,562	35,815	44,866
Income tax expense ^(a)	11,228	6,684	8,435
Net income	\$ 48,334	\$ 29,131	\$ 36,431
Earnings per share data			
Net income: Basic	\$ 15.39	\$ 8.89	\$ 10.75
Diluted	15.36	8.88	10.72
Average shares: Basic	3,021.5	3,082.4	3,221.5
Diluted	3,026.6	3,087.4	3,230.4
Market and per common share data			
Market capitalization	\$ 466,206	\$ 387,492	\$ 429,913
Common shares at period-end	2,944.1	3,049.4	3,084.0
Book value per share	88.07	81.75	75.98
Tangible book value per share ("TBVPS") ^(b)	71.53	66.11	60.98
Cash dividends declared per share	3.80	3.60	3.40
Selected ratios and metrics			
Return on common equity ("ROE") ^(c)	19 %	12 %	15 %
Return on tangible common equity ("ROTCE") ^{(b)(c)}	23	14	19
Return on assets ("ROA") ^(b)	1.30	0.91	1.33
Overhead ratio	59	56	56
Loans-to-deposits ratio	44	47	64
Firm Liquidity coverage ratio ("LCR") (average) ^(d)	111	110	116
JPMorgan Chase Bank, N.A. LCR (average) ^(d)	178	160	116
Common equity Tier 1 ("CET1") capital ratio ^(e)	13.1	13.1	12.4
Tier 1 capital ratio ^(e)	15.0	15.0	14.1
Total capital ratio ^(e)	16.8	17.3	16.0
Tier 1 leverage ratio ^{(e)(f)}	6.5	7.0	7.9
Supplementary leverage ratio ("SLR") ^{(e)(f)}	5.4 %	6.9 %	6.3 %
Selected balance sheet data (period-end)			
Trading assets	\$ 433,575	\$ 503,126	\$ 369,687
Investment securities, net of allowance for credit losses	672,232	589,999	398,239
Loans	1,077,714	1,012,853	997,620
Total assets ^(a)	3,743,567	3,384,757	2,686,477
Deposits	2,462,303	2,144,257	1,562,431
Long-term debt	301,005	281,685	291,498
Common stockholders' equity	259,289	249,291	234,337
Total stockholders' equity	294,127	279,354	261,330
Headcount	271,025	255,351	256,981
Credit quality metrics			
Allowances for loan losses and lending-related commitments	\$ 18,689	\$ 30,815	\$ 14,314
Allowance for loan losses to total retained loans	1.62 %	2.95 %	1.39 %
Nonperforming assets	\$ 8,346	\$ 10,906	\$ 5,054
Net charge-offs	2,865	5,259	5,629
Net charge-off rate	0.30 %	0.55 %	0.60 %

Effective January 1, 2020, the Firm adopted the Financial Instruments - Credit Losses ("CECL") accounting guidance. Refer to Note 1 for further information.

- (a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.
- (b) Pre-provision profit, TBVPS and ROTCE are each non-GAAP financial measures. Tangible common equity ("TCE") is also a non-GAAP financial measure. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60 for a discussion of these measures.
- (c) Quarterly ratios are based upon annualized amounts.
- (d) For the years ended December 31, 2021, 2020 and 2019, the percentage represents average LCR for the three months ended December 31, 2021, 2020 and 2019. Refer to Liquidity Risk Management on pages 97-104 for additional information on the LCR results.
- (e) As of December 31, 2021 and 2020, the capital metrics reflect the relief provided by the Federal Reserve Board in response to the COVID-19 pandemic, including the Current Expected Credit Losses ("CECL") capital transition provisions that became effective in the first quarter of 2020 and expired on December 31, 2021. As of December 31, 2020, the SLR reflected the temporary exclusions of U.S. Treasury securities and deposits at Federal Reserve Banks, which became effective April 1, 2020 and remained in effect through March 31, 2021. Refer to Capital Risk Management on pages 86-96 for additional information.
- (f) For the years ended December 31, 2021, 2020 and 2019, the percentage represents average ratios for the three months ended December 31, 2021, 2020 and 2019. Refer to Capital Risk Management on pages 86-96 for additional information on the capital metrics.

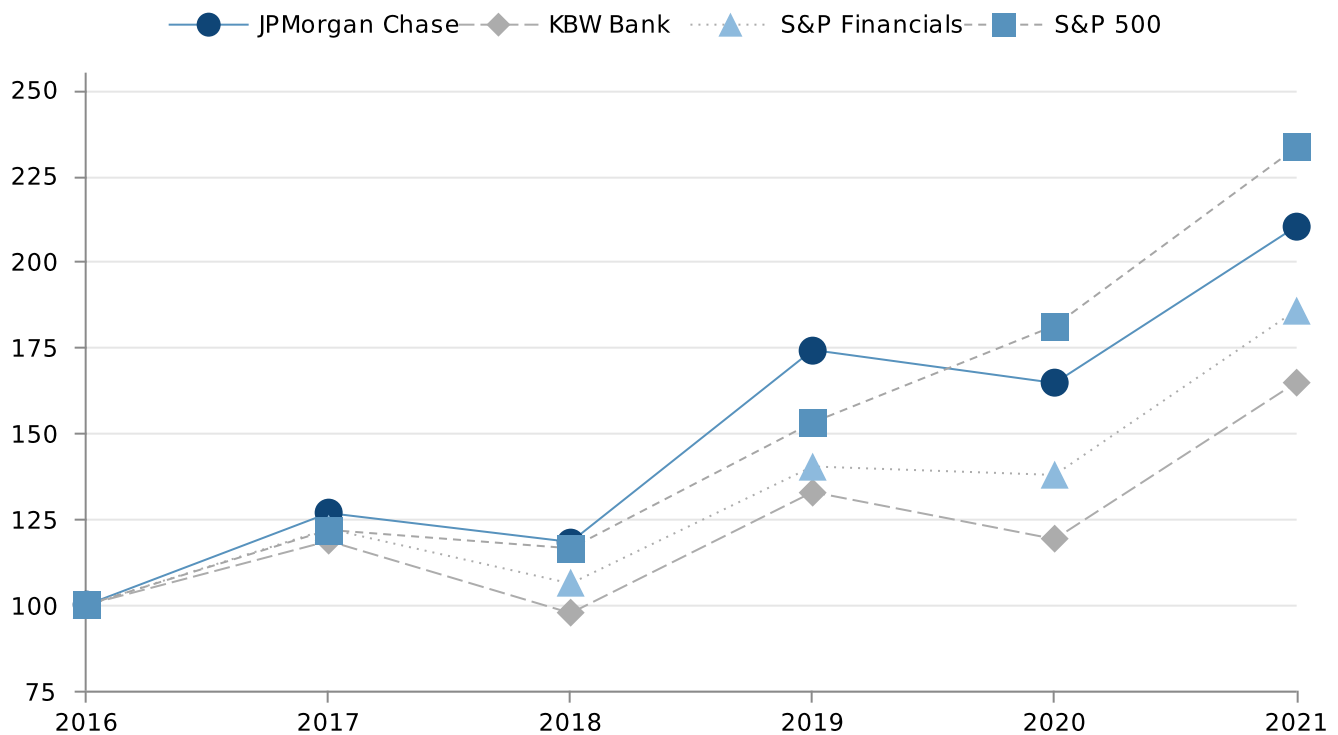
FIVE-YEAR STOCK PERFORMANCE

The following table and graph compare the five-year cumulative total return for JPMorgan Chase & Co. (“JPMorgan Chase” or the “Firm”) common stock with the cumulative return of the S&P 500 Index, the KBW Bank Index and the S&P Financials Index. The S&P 500 Index is a commonly referenced equity benchmark in the United States of America (“U.S.”), consisting of leading companies from different economic sectors. The KBW Bank Index seeks to reflect the performance of banks and thrifts that are publicly traded in the U.S. and is composed of leading national money center and regional banks and thrifts. The S&P Financials Index is an index of financial companies, all of which are components of the S&P 500. The Firm is a component of all three industry indices.

The following table and graph assume simultaneous investments of \$100 on December 31, 2016, in JPMorgan Chase common stock and in each of the above indices. The comparison assumes that all dividends were reinvested.

December 31, (in dollars)	2016	2017	2018	2019	2020	2021
JPMorgan Chase	\$ 100.00	\$ 126.73	\$ 118.31	\$ 174.23	\$ 164.62	\$ 210.26
KBW Bank Index	100.00	118.59	97.59	132.84	119.15	164.83
S&P Financials Index	100.00	122.14	106.21	140.30	137.83	185.90
S&P 500 Index	100.00	121.82	116.47	153.13	181.29	233.28

December 31,
(in dollars)



Management's discussion and analysis

The following is Management's discussion and analysis of the financial condition and results of operations ("MD&A") of JPMorgan Chase for the year ended December 31, 2021. The MD&A is included in both JPMorgan Chase's Annual Report for the year ended December 31, 2021 ("Annual Report") and its Annual Report on Form 10-K for the year ended December 31, 2021 ("2021 Form 10-K") filed with the Securities and Exchange Commission ("SEC"). Refer to the Glossary of terms and acronyms on pages 305-311 for definitions of terms and acronyms used throughout the Annual Report and the 2021 Form 10-K.

This Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements are based on the current beliefs and expectations of JPMorgan Chase's management, speak only as of the date of this Form 10-K and are subject to significant risks and uncertainties. Refer to Forward-looking Statements on page 155 and Part 1, Item 1A: Risk factors in the 2021 Form 10-K on pages 9-33 for a discussion of certain of those risks and uncertainties and the factors that could cause JPMorgan Chase's actual results to differ materially because of those risks and uncertainties. There is no assurance that actual results will be in line with any outlook information set forth herein, and the Firm does not undertake to update any forward-looking statements.

INTRODUCTION

JPMorgan Chase & Co. (NYSE: JPM), a financial holding company incorporated under Delaware law in 1968, is a leading financial services firm based in the United States of America ("U.S."), with operations worldwide. JPMorgan Chase had \$3.7 trillion in assets and \$294.1 billion in stockholders' equity as of December 31, 2021. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Firm serves millions of customers, predominantly in the U.S., and many of the world's most prominent corporate, institutional and government clients globally.

JPMorgan Chase's principal bank subsidiary is JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A."), a national banking association with U.S. branches in 48 states and Washington, D.C. as of December 31, 2021. JPMorgan Chase's principal nonbank subsidiary is J.P. Morgan Securities LLC ("J.P. Morgan Securities"), a U.S. broker-dealer. The bank and non-bank subsidiaries of JPMorgan Chase operate nationally as well as through overseas branches and subsidiaries, representative offices and subsidiary foreign banks. The Firm's principal operating subsidiary outside the U.S. is J.P. Morgan Securities plc, a U.K.-based subsidiary of JPMorgan Chase Bank, N.A.

For management reporting purposes, the Firm's activities are organized into four major reportable business segments, as well as a Corporate segment. The Firm's consumer business is the Consumer & Community Banking ("CCB") segment. The Firm's wholesale business segments are the Corporate & Investment Bank ("CIB"), Commercial Banking ("CB"), and Asset & Wealth Management ("AWM"). Refer to Business Segment Results on pages 61-80, and Note 32 for a description of the Firm's business segments, and the products and services they provide to their respective client bases.

The Firm's website is www.jpmorganchase.com. JPMorgan Chase makes available on its website, free of charge, annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934, as soon as reasonably practicable after it electronically files or furnishes such material to the U.S. Securities and Exchange Commission (the "SEC") at www.sec.gov. JPMorgan Chase makes new and important information about the Firm available on its website at <https://www.jpmorganchase.com>, including on the Investor Relations section of its website at <https://www.jpmorganchase.com/ir>. Information on the Firm's website is not incorporated by reference into this 2021 Form 10-K or the Firm's other filings with the SEC.

EXECUTIVE OVERVIEW

This executive overview of the MD&A highlights selected information and does not contain all of the information that is important to readers of this 2021 Form 10-K. For a complete description of the trends and uncertainties, as well as the risks and critical accounting estimates, affecting the Firm, this 2021 Form 10-K should be read in its entirety.

Financial performance of JPMorgan Chase

Year ended December 31, (in millions, except per share data and ratios)	2021	2020	Change
Selected income statement data			
Total net revenue ^(a)	\$121,649	\$119,951	1 %
Total noninterest expense	71,343	66,656	7
Pre-provision profit	50,306	53,295	(6)
Provision for credit losses	(9,256)	17,480	NM
Net income	48,334	29,131	66
Diluted earnings per share	15.36	8.88	73
Selected ratios and metrics			
Return on common equity	19 %	12 %	
Return on tangible common equity	23	14	
Book value per share	\$ 88.07	\$ 81.75	8
Tangible book value per share	71.53	66.11	8
Capital ratios^(b)			
CET1 capital	13.1 %	13.1 %	
Tier 1 capital	15.0	15.0	
Total capital	16.8	17.3	

(a) Prior-period amount has been revised to conform with the current presentation. Refer to Note 25 for further information.

(b) The capital metrics reflect the relief provided by the Federal Reserve Board in response to the COVID-19 pandemic, including the CECL capital transition provisions that became effective in the first quarter of 2020 and expired on December 31, 2021. Refer to Capital Risk Management on pages 86-96 for additional information.

Comparisons noted in the sections below are for the full year of 2021 versus the full year of 2020, unless otherwise specified.

Firmwide overview

JPMorgan Chase reported net income of \$48.3 billion for 2021, or \$15.36 per share, on net revenue of \$121.6 billion. The Firm reported ROE of 19% and ROTCE of 23%. The Firm's results for 2021 included a reduction in the allowance for credit losses of \$12.1 billion.

- The Firm had net income of \$48.3 billion, up 66%, driven by a net benefit in the provision for credit losses, compared to an expense recorded in the prior year.
- Total net revenue was up 1%.
 - Noninterest revenue was \$69.3 billion, up 6%, driven by higher Investment Banking fees and asset management fees, partially offset by lower CIB Markets revenue.
 - Net interest income was \$52.3 billion, down 4%, driven by the impact of lower market rates and changes in the balance sheet mix, partially offset by balance sheet growth.

- Noninterest expense was \$71.3 billion, up 7%, predominantly driven by higher compensation expense and continued investments in the business, including technology.
- The provision for credit losses was a net benefit of \$9.3 billion, driven by;
 - a \$12.1 billion reduction in the allowance for credit losses primarily reflecting improvements in the Firm's macroeconomic outlook, and
 - \$2.9 billion of net charge-offs predominantly driven by Card

The prior year provision was an expense of \$17.5 billion, reflecting a net addition to the allowance for credit losses of \$12.2 billion, and \$5.3 billion of net charge-offs.

- The total allowance for credit losses was \$18.7 billion at December 31, 2021. The Firm had an allowance for loan losses to retained loans coverage ratio of 1.62%, compared with 2.95% in the prior year; the decrease from the prior year was driven by reductions in the allowance for credit losses.
- The Firm's nonperforming assets totaled \$8.3 billion at December 31, 2021, a decrease of \$2.6 billion from the prior year, driven by lower nonaccrual loans, reflecting the impact of net portfolio activity and client-specific upgrades in wholesale, as well as improved credit performance in consumer; and lower loans at fair value in the CIB consumer portfolio, largely due to sales.
- Firmwide average loans of \$1.0 trillion were up 3%, driven by higher loans in AWM and CIB, partially offset by lower loans in CCB and CB.
- Firmwide average deposits of \$2.3 trillion were up 23%, reflecting significant inflows across the LOBs, primarily driven by the effect of certain government actions in response to the COVID-19 pandemic, as well as growth from existing and new accounts in CCB.

Selected capital-related metrics

- The Firm's CET1 capital was \$214 billion, and the Standardized and Advanced CET1 ratios were 13.1% and 13.8%, respectively.
- The Firm's SLR was 5.4%.
- The Firm grew TBVPS, ending 2021 at \$71.53, up 8% versus the prior year.

Pre-provision profit, ROTCE, TCE and TBVPS are non-GAAP financial measures. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60, and Capital Risk Management on pages 86-96 for a discussion of each of these measures.

Management's discussion and analysis

Business segment highlights

Selected business metrics for each of the Firm's four LOBs are presented below for the full year of 2021.

CCB ROE 41%	<ul style="list-style-type: none"> • Average deposits up 24%; client investment assets up 22% • Average loans down 3%; Card net charge-off rate of 1.94% • Debit and credit card sales volume^(a) up 26% • Active mobile customers up 11%
CIB ROE 25%	<ul style="list-style-type: none"> • \$13.4 billion of Global Investment Banking fees, up 41% • #1 ranking for Global Investment Banking fees with 9.5% wallet share for the year • Total Markets revenue of \$27.4 billion, down 7%, with Fixed Income Markets down 19% and Equity Markets up 22%
CB ROE 21%	<ul style="list-style-type: none"> • Gross Investment Banking revenue of \$5.1 billion, up 52% • Average deposits up 27%; average loans down 6%
AWM ROE 33%	<ul style="list-style-type: none"> • Assets under management (AUM) of \$3.1 trillion, up 15% • Average deposits up 42%; average loans up 19%

(a) Excludes Commercial Card

Refer to the Business Segment Results on pages 61-62 for a detailed discussion of results by business segment.

Credit provided and capital raised

JPMorgan Chase continues to support consumers, businesses and communities around the globe. The Firm provided new and renewed credit and raised capital for wholesale and consumer clients during 2021, consisting of:

\$3.2 trillion	Total credit provided and capital raised (including loans and commitments) ^(a)
\$331 billion	Credit for consumers
\$22 billion	Credit for U.S. small businesses
\$1.3 trillion	Credit for corporations
\$1.5 trillion	Capital raised for corporate clients and non-U.S. government entities
\$63 billion	Credit and capital raised for nonprofit and U.S. government entities ^(b)
\$11 billion	Loans under the Small Business Administration's Paycheck Protection Program

(a) Excludes loans under the SBA's PPP.

(b) Includes states, municipalities, hospitals and universities.

Recent events

- On January 25, 2022, JPMorgan Chase announced that it entered into an agreement with Viva Wallet Holdings Software Development S.A. to acquire an ownership stake of approximately 49% in the cloud-based payments financial technology company, subject to regulatory approvals.
- On January 24, 2022, JPMorgan Chase announced that it has merged three of its EU credit institution subsidiaries into a single subsidiary, J.P. Morgan SE, which is headquartered in Germany and has a branch network across the European Economic Area, as well as a branch in London.
- On January 1, 2022, Daniel Pinto became the sole President and Chief Operating Officer of JPMorgan Chase after the retirement of Gordon Smith at the end of 2021. Mr. Pinto continues to serve as the CEO of CIB, and the CEOs of the other LOBs report jointly to Mr. Pinto and Jamie Dimon, Chairman and CEO of the Firm.

2022 outlook

These current expectations are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward-looking statements are based on the current beliefs and expectations of JPMorgan Chase's management and are subject to significant risks and uncertainties. Refer to Forward-Looking Statements on page 155, and the Risk Factors section on pages 9-33 of the Firm's 2021 Form 10-K, for a further discussion of certain of those risks and uncertainties and the other factors that could cause JPMorgan Chase's actual results to differ materially because of those risks and uncertainties. There is no assurance that actual results in 2022 will be in line with the outlook information set forth below, and the Firm does not undertake to update any forward-looking statements.

JPMorgan Chase's current outlook for 2022 should be viewed against the backdrop of the global and U.S. economies, the COVID-19 pandemic, financial markets activity, the geopolitical environment, the competitive environment, client and customer activity levels, and regulatory and legislative developments in the U.S. and other countries where the Firm does business. Each of these factors will affect the performance of the Firm and its LOBs. The Firm will continue to make appropriate adjustments to its businesses and operations in response to ongoing developments in the business, economic, regulatory and legal environments in which it operates. The outlook information contained in this Form 10-K supersedes all outlook information provided by the Firm in its periodic reports furnished to or filed with the SEC prior to the date of this Form 10-K.

Full-year 2022

- Management expects net interest income on a managed basis, excluding CIB Markets, to be in excess of \$53 billion, market dependent.
- Management expects adjusted expense to be approximately \$77 billion, which includes increased investments in technology, distribution and marketing, and higher structural expense.

Net interest income on a managed basis, excluding CIB Markets, and adjusted expense are non-GAAP financial measures. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60.

Business Developments

COVID-19 Pandemic

As the COVID-19 pandemic has continued to evolve, the Firm has remained focused on serving its clients, customers and communities, as well as the well-being of its employees. The Firm continues to actively monitor and adapt to health and safety developments at local and regional levels as more of its global workforce returns to the office.

For information on the impact of U.S. government actions and programs in response to the COVID-19 pandemic, refer to:

- Credit Portfolio on page 109 for information on PPP,
- Consumer Credit Portfolio on page 112 and Wholesale Credit Portfolio on page 118 for information on retained loans under payment deferral, and
- Note 12 on page 231 for information on the Firm's loan modification activities.

Interbank Offered Rate ("IBOR") transition

JPMorgan Chase and other market participants continue to make progress with respect to the transition from the use of the London Interbank Offered Rate ("LIBOR") and other IBORs to comply with the International Organization of Securities Commission's standards for transaction-based benchmark rates. As of January 1, 2022, ICE Benchmark Administration ceased the publication of all tenors of LIBOR for U.K. sterling, Japanese yen, Swiss franc and Euro LIBOR (collectively, "non-U.S. dollar LIBOR") and the one-week and two-month tenors of U.S. dollar LIBOR. The cessation of the publication of the principal tenors of U.S. dollar LIBOR (i.e., overnight, one-month, three-month, six-month and 12-month LIBOR) is scheduled for June 30, 2023.

In joint statements issued by the Federal Reserve, the OCC and the FDIC, the banking regulators encouraged U.S. banks to cease entering into new contracts that use U.S. dollar LIBOR as a reference rate by December 31, 2021. The Firm has ceased executing contracts that reference U.S. dollar LIBOR, with certain permissible limited exceptions, and now offers various floating rate products, and provides and arranges various types of floating rate debt financings, across its businesses that reference replacement rates, including the Secured Overnight Financing Rate ("SOFR"). The Firm continues to engage with clients in relation to the transition from the principal tenors of U.S. dollar LIBOR and to support clients as they move to replacement rates.

On November 16, 2021 the Financial Conduct Authority ("FCA") confirmed that it will allow, for a period of at least one year, the use of "synthetic" U.K. sterling and Japanese yen LIBOR rates in all legacy LIBOR contracts, other than cleared derivatives, that had not been transitioned to replacement rates by January 1, 2022. The use of these synthetic LIBORs, will allow market participants additional time to complete their transition to replacement rates or otherwise to reduce their exposure to contracts that do not have robust fallback mechanisms and that are difficult to amend.

During the fourth quarter of 2021, the principal central counterparties ("CCPs") converted cleared derivatives contracts linked to non-U.S. dollar LIBOR to replacement rates before the cessation of the publication of those LIBORs on December 31, 2021.

The Firm has made significant progress towards reducing its exposure to IBOR-referencing contracts, including in derivatives, bilateral and syndicated loans, securities, and debt and preferred stock issuances, and is on-track to meet its internal milestones for contract remediation as well as the industry milestones and recommendations published by National Working Groups, including the Alternative Reference Rates Committee in the U.S.

In connection with the transition from LIBOR, as of December 31, 2021 the Firm had remediated substantially all of the notional amount of its bilateral derivatives contracts linked to U.S. dollar LIBOR and non-U.S. dollar

LIBOR, and substantially all of its non-U.S. dollar LIBOR-linked loans. The Firm continues its client outreach with respect to U.S. dollar LIBOR-linked loans.

The Firm is also on schedule to implement further necessary changes to risk management systems in order to transition from LIBOR, including modifications to its operational systems and models. In 2021, the Firm changed the rate basis of its transfer pricing methodology for U.S. dollar-denominated contracts to SOFR and implemented internal controls to restrict the use of LIBOR in new transactions.

Legislation intended to reduce the likelihood of disputes arising from the cessation of LIBOR has been adopted or proposed in certain jurisdictions. The Firm continues to review the extent to which these legislative actions or proposals, if enacted, may reduce the risk of litigation and disputes arising from the transition from LIBOR.

The Firm continues to monitor and evaluate client, industry, market, regulatory and legislative developments, including the transition relief issued by the Internal Revenue Service and U.S. Treasury Department in January 2022 with respect to the tax implications of reference rate reform.

Management's discussion and analysis

CONSOLIDATED RESULTS OF OPERATIONS

This section provides a comparative discussion of JPMorgan Chase's Consolidated Results of Operations on a reported basis for the two-year period ended December 31, 2021, unless otherwise specified. Refer to Consolidated Results of Operations on pages 54-56 of the Firm's Annual Report on Form 10-K for the year ended December 31, 2020 (the "2020 Form 10-K") for a discussion of the 2020 versus 2019 results. Factors that relate primarily to a single business segment are discussed in more detail within that business segment's results. Refer to pages 150-153 for a discussion of the Critical Accounting Estimates Used by the Firm that affect the Consolidated Results of Operations.

Revenue

Year ended December 31, (in millions)	2021	2020	2019
Investment banking fees	\$ 13,216	\$ 9,486	\$ 7,501
Principal transactions	16,304	18,021	14,018
Lending- and deposit-related fees	7,032	6,511	6,626
Asset management, administration and commissions	21,029	18,177	16,908
Investment securities gains/(losses)	(345)	802	258
Mortgage fees and related income	2,170	3,091	2,036
Card income	5,102	4,435	5,076
Other income ^{(a)(b)}	4,830	4,865	6,052
Noninterest revenue	69,338	65,388	58,475
Net interest income	52,311	54,563	57,245
Total net revenue	\$ 121,649	\$ 119,951	\$ 115,720

(a) Included operating lease income of \$4.9 billion, for the year ended December 31, 2021, and \$5.5 billion for each of the years ended December 31, 2020 and 2019.

(b) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

2021 compared with 2020

Investment banking fees increased across products in CIB, reflecting:

- higher advisory fees driven by increased M&A activity and wallet share gains
- higher equity underwriting fees due to a strong IPO market and wallet share gains, and
- higher debt underwriting fees predominantly driven by an active leveraged loan market primarily related to acquisition financing.

Refer to CIB segment results on pages 67-72 and Note 6 for additional information.

Principal transactions revenue decreased, reflecting:

- lower revenue in CIB Fixed Income Markets, primarily in Rates, Currencies & Emerging Markets, Credit and Commodities, compared to a strong prior year, and an increase in Securitized Products, and
- lower net valuation gains on several legacy equity investments in Corporate,

partially offset by

- higher revenue in CIB Equity Markets driven by strong performance across derivatives, prime brokerage, and Cash Equities

- favorable results in CIB's Credit Adjustments & Other, with a net gain of \$250 million predominantly driven by valuation adjustments related to derivatives, compared with a \$29 million net loss in the prior year, and
- the absence of losses recorded in the prior year in Treasury and CIO related to cash deployment transactions, which were more than offset by the related net interest income earned on these transactions, also in the prior year.

Refer to CIB and Corporate segment results on pages 67-72 and pages 79-80, respectively, and Note 6 for additional information.

Lending- and deposit-related fees increased as a result of:

- higher cash management fees in CIB and CB, and higher lending-related fees, particularly loan commitment fees in CIB,

predominantly offset by

- lower overdraft fee revenue in CCB.

Refer to CCB, CIB and CB segment results on pages 63-66, pages 67-72 and pages 73-75, respectively, and Note 6 for additional information.

Asset management, administration and commissions revenue increased driven by:

- higher asset management fees in AWM and CCB as a result of higher average market levels and net inflows, and
- higher custody fees in CIB Securities Services, primarily associated with higher assets under custody.

Refer to CCB, CIB and AWM segment results on pages 63-66, pages 67-72 and pages 76-78, respectively, and Note 6 for additional information.

Investment securities gains/(losses) reflected net losses related to repositioning the investment securities portfolio, compared with net gains in the prior year from sales of U.S. GSE and government agency MBS. Refer to Corporate segment results on pages 79-80 and Note 10 for additional information.

Mortgage fees and related income decreased due to:

- lower net mortgage servicing revenue, reflecting a net loss in MSR risk management results primarily driven by updates to model inputs related to prepayment expectations, and
- lower mortgage production revenue on lower production margins.

Refer to CCB segment results on pages 63-66, Note 6 and 15 for further information.

Card income increased due to:

- higher net interchange income in CCB driven by an increase in debit and credit card sales volume above pre-pandemic levels, partially offset by the impact of a renegotiation of a co-brand partner contract, as well as an increase to the rewards liability, and

- higher payments revenue related to commercial card and merchant processing in CB and CIB on higher volume, partially offset by
- higher amortization related to new account origination costs in CCB.

Refer to CCB, CIB and CB segment results on pages 63-66, pages 67-72 and pages 73-75, respectively, and Note 6 for further information.

Other income decreased reflecting:

- lower auto operating lease income in CCB as a result of a decline in volume, and
- increased amortization on a higher level of alternative energy investments in the tax-oriented investment portfolio in CIB. The increased amortization was more than offset by lower income tax expense from the associated tax credits,

predominantly offset by

- net gains on several investments, primarily in CIB and AWM, and
- the absence of losses recorded in the prior year related to the early termination of certain of the Firm's long-term debt in Treasury and CIO.

Net interest income decreased driven by the impact of lower market rates and changes in the balance sheet mix, partially offset by balance sheet growth.

The Firm's average interest-earning assets were \$3.2 trillion, up \$436 billion, predominantly driven by higher deposits with banks and investment securities, and the yield was 1.81%, down 53 basis points ("bps"). The net yield on these assets, on an FTE basis, was 1.64%, a decrease of 34 bps. The net yield excluding CIB Markets was 1.91%, down 39 bps.

Net yield excluding CIB Markets is a non-GAAP financial measure. Refer to the Consolidated average balance sheets, interest and rates schedule on pages 300-304 for further details; and the Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60 for a further discussion of Net interest yield excluding CIB Markets.

Provision for credit losses

Year ended December 31, (in millions)	2021	2020	2019
Consumer, excluding credit card	\$ (1,933)	\$ 1,016	\$ (378)
Credit card	(4,838)	10,886	5,348
Total consumer	(6,771)	11,902	4,970
Wholesale	(2,449)	5,510	615
Investment securities	(36)	68	NA
Total provision for credit losses	\$ (9,256)	\$ 17,480	\$ 5,585

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

2021 compared with 2020

The **provision for credit losses** was a net benefit driven by net reductions in the allowance for credit losses.

The net benefit in **consumer** was driven by:

- a \$9.5 billion reduction in the allowance for credit losses, reflecting improvements in the Firm's macroeconomic outlook, including \$7.6 billion in Card, and \$1.2 billion in Home Lending, which also reflects continued improvements in Home Price Index ("HPI") expectations, and
- lower net charge-offs predominantly in Card, as consumer cash balances remained elevated;
- the prior year included a \$7.4 billion net addition to the allowance for credit losses.

The net benefit in **wholesale** was due to a net reduction of \$2.6 billion in the allowance for credit losses across the LOBs, reflecting improvements in the Firm's macroeconomic outlook. The prior year included a \$4.7 billion net addition to the allowance for credit losses.

Refer to the segment discussions of CCB on pages 63-66, CIB on pages 67-72, CB on pages 73-75, AWM on pages 76-78, the Allowance for Credit Losses on pages 129-131, and Notes 1, 10 and 13 for further discussion of the credit portfolio and the allowance for credit losses.

Management's discussion and analysis

Noninterest expense

Year ended December 31, (in millions)	2021	2020	2019
Compensation expense	\$ 38,567	\$ 34,988	\$ 34,155
Noncompensation expense:			
Occupancy	4,516	4,449	4,322
Technology, communications and equipment ^(a)	9,941	10,338	9,821
Professional and outside services	9,814	8,464	8,533
Marketing	3,036	2,476	3,351
Other ^(b)	5,469	5,941	5,087
Total noncompensation expense	32,776	31,668	31,114
Total noninterest expense	\$ 71,343	\$ 66,656	\$ 65,269

(a) Includes depreciation expense associated with auto operating lease assets.

(b) Included Firmwide legal expense of \$426 million, \$1.1 billion and \$239 million for the years ended December 31, 2021, 2020 and 2019, respectively.

2021 compared with 2020

Compensation expense increased across the LOBs and Corporate, primarily from higher volume- and revenue-related expense, as well as the impact of investments in the businesses.

Noncompensation expense increased as a result of:

- higher volume-related expense, including outside services, predominantly brokerage expense in CIB and distribution fees in AWM
- higher marketing expense predominantly driven by higher investments in marketing campaigns and growth in travel-related benefits in CCB
- higher other investments, including technology expense across the LOBs
- higher contribution expense, which included a \$550 million donation of equity investments to the Firm's Foundation in the first quarter of 2021, and
- higher other structural expense, including regulatory-related expense,

partially offset by

- lower depreciation expense in CCB due to lower auto lease assets and the impact of higher vehicle collateral values
- lower legal expense, driven by CIB and AWM, and
- the absence of an impairment recorded in the prior year on a legacy investment in Corporate.

Income tax expense

Year ended December 31, (in millions, except rate)	2021	2020	2019
Income before income tax expense	\$59,562	\$35,815	\$44,866
Income tax expense ^(a)	11,228	6,684	8,435
Effective tax rate ^(a)	18.9 %	18.7 %	18.8 %

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

2021 compared with 2020

The **effective tax rate** was relatively flat as the settlement of tax audits was largely offset by changes in the level and mix of income and expenses subject to U.S. federal, and state and local taxes. Refer to Note 25 for further information.

CONSOLIDATED BALANCE SHEETS AND CASH FLOWS ANALYSIS

Consolidated balance sheets analysis

The following is a discussion of the significant changes between December 31, 2021 and 2020.

Selected Consolidated balance sheets data

December 31, (in millions)	2021	2020	Change
Assets			
Cash and due from banks	\$ 26,438	\$ 24,874	6 %
Deposits with banks	714,396	502,735	42
Federal funds sold and securities purchased under resale agreements	261,698	296,284	(12)
Securities borrowed	206,071	160,635	28
Trading assets	433,575	503,126	(14)
Available-for-sale securities	308,525	388,178	(21)
Held-to-maturity securities, net of allowance for credit losses	363,707	201,821	80
Investment securities, net of allowance for credit losses	672,232	589,999	14
Loans	1,077,714	1,012,853	6
Allowance for loan losses	(16,386)	(28,328)	(42)
Loans, net of allowance for loan losses	1,061,328	984,525	8
Accrued interest and accounts receivable	102,570	90,503	13
Premises and equipment	27,070	27,109	–
Goodwill, MSRs and other intangible assets	56,691	53,428	6
Other assets ^(a)	181,498	151,539	20
Total assets	\$ 3,743,567	\$ 3,384,757	11 %

(a) Prior-period amount has been revised to conform with the current presentation. Refer to Note 25 for further information.

Cash and due from banks and deposits with banks

increased primarily as a result of the continued growth in deposits and limited deployment opportunities in Treasury and CIO. Deposits with banks reflect the Firm's placements of its excess cash with various central banks, including the Federal Reserve Banks.

Federal funds sold and securities purchased under resale agreements

decreased driven by:

- lower deployment of funds in Treasury and CIO, and lower client-driven market-making activities in CIB Markets, partially offset by
- higher collateral requirements in CIB Markets.

Securities borrowed increased reflecting higher client-driven activities and an increase in the demand for securities to cover short positions in CIB Markets.

Refer to Note 11 for additional information on securities purchased under resale agreements and securities borrowed.

Trading assets

decreased reflecting;

- a lower level of securities, primarily debt instruments related to client-driven market-making activities in CIB Fixed Income Markets
- lower derivative receivables, primarily as a result of market movements, as well as maturities of certain trades in CIB, and
- lower deployment of funds in Treasury and CIO.

Refer to Notes 2 and 5 for additional information.

Investment securities increased due to the net impact of purchases and paydowns in the available-for-sale ("AFS") and held-to-maturity ("HTM") portfolios, largely offset by sales in the AFS portfolio. In the second quarter of 2021, \$104.5 billion of AFS were transferred to the HTM portfolio for capital management purposes. Refer to Corporate segment results on pages 79-80, Investment Portfolio Risk Management on page 132 and Notes 2 and 10 for additional information on investment securities.

Loans

increased, reflecting:

- higher secured lending in CIB Markets; continued strength in securities-based lending, custom lending and mortgages in AWM; and growth in Card, partially offset by

- a decline in CBB and CB due to the net impact of PPP loan forgiveness and loan originations, and
- lower retained residential real estate loans in Home Lending primarily due to net paydowns.

The allowance for loan losses decreased primarily as a result of improvements in the macroeconomic environment. The decline in the allowance consisted of:

- a \$9.4 billion reduction in consumer, reflecting improvements in the Firm's macroeconomic outlook, predominantly in the credit card and residential real estate portfolios. The residential real estate portfolio also reflects continued improvements in HPI expectations, and
- a \$2.5 billion net reduction in wholesale, across the LOBs, reflecting improvements in the Firm's macroeconomic outlook.

Management's discussion and analysis

There was a \$148 million net reduction in the allowance for lending-related commitments, driven by both wholesale and consumer. This allowance is included in other liabilities on the consolidated balance sheets. The total net reduction in the allowance for credit losses was \$12.1 billion, as of December 31, 2021.

Refer to Credit and Investment Risk Management on pages 106-132, and Notes 1, 2, 3, 12 and 13 for further discussion of loans and the allowance for loan losses.

Accrued interest and accounts receivable increased due to higher client receivables related to client-driven activities primarily in CIB prime brokerage.

Refer to Note 16 and 18 for additional information on **Premises and equipment**.

Selected Consolidated balance sheets data

December 31, (in millions)	2021	2020	Change
Liabilities			
Deposits	\$ 2,462,303	\$ 2,144,257	15
Federal funds purchased and securities loaned or sold under repurchase agreements	194,340	215,209	(10)
Short-term borrowings	53,594	45,208	19
Trading liabilities	164,693	170,181	(3)
Accounts payable and other liabilities ^(a)	262,755	231,285	14
Beneficial interests issued by consolidated variable interest entities ("VIEs")	10,750	17,578	(39)
Long-term debt	301,005	281,685	7
Total liabilities	3,449,440	3,105,403	11
Stockholders' equity	294,127	279,354	5
Total liabilities and stockholders' equity	\$ 3,743,567	\$ 3,384,757	11 %

(a) Prior-period amount has been revised to conform with the current presentation. Refer to Note 25 for further information.

Deposits increased across the LOBs primarily driven by the effect of certain government actions in response to the COVID-19 pandemic. In CCB, the increase was also driven by growth from new and existing accounts across both consumer and small business customers.

Refer to Liquidity Risk Management on pages 97-104; and Notes 2 and 17 for more information.

Federal funds purchased and securities loaned or sold under repurchase agreements decreased due to lower secured financing of AFS investment securities in Treasury and CIO, and trading assets in CIB Markets. Refer to Liquidity Risk Management on pages 97-104 and Note 11 for additional information.

Short-term borrowings increased as a result of higher financing of CIB Markets activities, as well as higher issuances of commercial paper in Treasury and CIO. Refer to Liquidity Risk Management on pages 97-104 for additional information.

Refer to Notes 2 and 5 for information on **trading liabilities**.

Accounts payable and other liabilities increased reflecting higher client payables related to client-driven activities primarily in CIB prime brokerage. Refer to Note 19 for additional information.

Goodwill, MSRs and other intangibles increased reflecting:

- higher MSRs as a result of net additions, partially offset by the realization of expected cash flows; and
- an increase in Goodwill as a result of the acquisitions of Nutmeg, OpenInvest, Frank, The Infatuation and Campbell Global.

Refer to Note 15 for additional information.

Other assets increased due to the higher cash collateral placed with central counterparties ("CCPs") in CIB, and higher tax receivables.

Beneficial interests issued by consolidated VIEs decreased driven by lower issuances of commercial paper as a result of lower loans in the Firm-administered multi-seller conduits in CIB, as well as maturities of credit card securitizations in Treasury and CIO.

Refer to Liquidity Risk Management on pages 97-104; and Notes 14 and 28 for additional information on Firm-sponsored VIEs and loan securitization trusts.

Long-term debt increased driven by net issuances, partially offset by fair value hedge accounting adjustments related to higher rates, and maturities of Federal Home Loan Bank ("FHLB") advances. Refer to Liquidity Risk Management on pages 97-104 and Note 20 for additional information.

Stockholders' equity increased reflecting net income, partially offset by the net impact of capital actions, and a decrease in accumulated other comprehensive income ("AOCI"). The decrease in AOCI was primarily driven by the impact of higher rates on the AFS securities portfolio and cash flow hedges. Refer to page 163 for information on changes in stockholders' equity, and Capital actions on page 94, Note 24 for additional information on AOCI.

Consolidated cash flows analysis

The following is a discussion of cash flow activities during the years ended December 31, 2021 and 2020. Refer to Consolidated cash flows analysis on page 59 of the Firm's 2020 Form 10-K for a discussion of the 2019 activities.

(in millions)	Year ended December 31,		
	2021	2020	2019
Net cash provided by/(used in)			
Operating activities	\$ 78,084	\$ (79,910)	\$ 4,092
Investing activities	(129,344)	(261,912)	(52,059)
Financing activities	275,993	596,645	32,987
Effect of exchange rate changes on cash	(11,508)	9,155	(182)
Net increase/(decrease) in cash and due from banks and deposits with banks	\$ 213,225	\$ 263,978	\$ (15,162)

Operating activities

JPMorgan Chase's operating assets and liabilities primarily support the Firm's lending and capital markets activities. These assets and liabilities can vary significantly in the normal course of business due to the amount and timing of cash flows, which are affected by client-driven and risk management activities and market conditions. The Firm believes that cash flows from operations, available cash and other liquidity sources, and its capacity to generate cash through secured and unsecured sources, are sufficient to meet its operating liquidity needs.

- In 2021, cash provided resulted from lower trading assets and higher accounts payable and other liabilities, partially offset by higher securities borrowed and lower trading liabilities.
- In 2020, cash used primarily reflected higher trading assets, other assets, and securities borrowed, partially offset by higher trading liabilities and net income excluding noncash adjustments.

Investing activities

The Firm's investing activities predominantly include originating held-for-investment loans and investing in the investment securities portfolio, and other short-term instruments.

- In 2021, cash used resulted from net purchases of investment securities and higher net originations of loans, partially offset by lower securities purchased under resale agreements.
- In 2020, cash used primarily reflected net purchases of investment securities, higher net originations of loans, and higher securities purchased under resale agreements.

Financing activities

The Firm's financing activities include acquiring customer deposits and issuing long-term debt and preferred stock.

- In 2021, cash provided reflected higher deposits and net proceeds from long- and short-term borrowings, partially offset by a decrease in securities loaned or sold under repurchase agreements.
- In 2020, cash provided reflected higher deposits and an increase in securities loaned or sold under repurchase agreements, partially offset by net payments of long-term borrowings.
- For both periods, cash was used for repurchases of common stock and cash dividends on common and preferred stock.

* * *

Refer to Consolidated Balance Sheets Analysis on pages 55-56, Capital Risk Management on pages 86-96, and Liquidity Risk Management on pages 97-104 for a further discussion of the activities affecting the Firm's cash flows.

EXPLANATION AND RECONCILIATION OF THE FIRM’S USE OF NON-GAAP FINANCIAL MEASURES

Non-GAAP financial measures

The Firm prepares its Consolidated Financial Statements in accordance with U.S. GAAP; these financial statements appear on pages 160-164. That presentation, which is referred to as “reported” basis, provides the reader with an understanding of the Firm’s results that can be tracked consistently from year-to-year and enables a comparison of the Firm’s performance with the U.S. GAAP financial statements of other companies.

In addition to analyzing the Firm’s results on a reported basis, management reviews Firmwide results, including the overhead ratio, on a “managed” basis; these Firmwide managed basis results are non-GAAP financial measures. The Firm also reviews the results of the LOBs on a managed basis. The Firm’s definition of managed basis starts, in each case, with the reported U.S. GAAP results and includes certain reclassifications to present total net revenue for the Firm (and each of the reportable business segments) on an FTE basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in the managed results on a basis comparable to taxable investments and securities. These financial measures allow

management to assess the comparability of revenue from year-to-year arising from both taxable and tax-exempt sources. The corresponding income tax impact related to tax-exempt items is recorded within income tax expense. These adjustments have no impact on net income as reported by the Firm as a whole or by the LOBs.

Management also uses certain non-GAAP financial measures at the Firm and business-segment level because these other non-GAAP financial measures provide information to investors about the underlying operational performance and trends of the Firm or of the particular business segment, as the case may be, and, therefore, facilitate a comparison of the Firm or the business segment with the performance of its relevant competitors. Refer to Business Segment Results on pages 61-80 for additional information on these non-GAAP measures. Non-GAAP financial measures used by the Firm may not be comparable to similarly named non-GAAP financial measures used by other companies.

The following summary table provides a reconciliation from the Firm’s reported U.S. GAAP results to managed basis.

Year ended December 31, (in millions, except ratios)	2021			2020			2019		
	Reported	Fully taxable-equivalent adjustments ^(b)	Managed basis	Reported	Fully taxable-equivalent adjustments ^(b)	Managed basis	Reported	Fully taxable-equivalent adjustments ^(b)	Managed basis
Other income ^(a)	\$ 4,830	\$ 3,225	\$ 8,055	\$ 4,865	\$ 2,560	\$ 7,425	\$ 6,052	\$ 2,213	\$ 8,265
Total noninterest revenue	69,338	3,225	72,563	65,388	2,560	67,948	58,475	2,213	60,688
Net interest income	52,311	430	52,741	54,563	418	54,981	57,245	531	57,776
Total net revenue	121,649	3,655	125,304	119,951	2,978	122,929	115,720	2,744	118,464
Total noninterest expense	71,343	NA	71,343	66,656	NA	66,656	65,269	NA	65,269
Pre-provision profit	50,306	3,655	53,961	53,295	2,978	56,273	50,451	2,744	53,195
Provision for credit losses	(9,256)	NA	(9,256)	17,480	NA	17,480	5,585	NA	5,585
Income before income tax expense	59,562	3,655	63,217	35,815	2,978	38,793	44,866	2,744	47,610
Income tax expense ^(a)	11,228	3,655	14,883	6,684	2,978	9,662	8,435	2,744	11,179
Net income	\$ 48,334	NA	\$ 48,334	\$ 29,131	NA	\$ 29,131	\$ 36,431	NA	\$ 36,431
Overhead ratio ^(a)	59 %	NM	57 %	56 %	NM	54 %	56 %	NM	55 %

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

(b) Predominantly recognized in CIB, CB and Corporate.

Net interest income, net yield, and noninterest revenue excluding CIB Markets

In addition to reviewing net interest income, net yield, and noninterest revenue on a managed basis, management also reviews these metrics excluding CIB Markets, as shown below. CIB Markets consists of Fixed Income Markets and Equity Markets. These metrics, which exclude CIB Markets, are non-GAAP financial measures. Management reviews these metrics to assess the performance of the Firm's lending, investing (including asset-liability management) and deposit-raising activities, apart from any volatility associated with CIB Markets activities. In addition, management also assesses CIB Markets business performance on a total revenue basis as offsets may occur across revenue lines. Management believes that these measures provide investors and analysts with alternative measures to analyze the revenue trends of the Firm.

Year ended December 31, (in millions, except rates)	2021	2020	2019
Net interest income - reported	\$ 52,311	\$ 54,563	\$ 57,245
Fully taxable-equivalent adjustments	430	418	531
Net interest income - managed basis^(a)	\$ 52,741	\$ 54,981	\$ 57,776
Less: CIB Markets net interest income ^(b)	8,243	8,374	3,120
Net interest income excluding CIB Markets^(a)	\$ 44,498	\$ 46,607	\$ 54,656
Average interest-earning assets	\$3,215,942	\$2,779,710	\$2,345,279
Less: Average CIB Markets interest-earning assets ^(b)	888,238	751,131	672,417
Average interest-earning assets excluding CIB Markets	\$2,327,704	\$2,028,579	\$1,672,862
Net yield on average interest-earning assets - managed basis	1.64 %	1.98 %	2.46 %
Net yield on average CIB Markets interest-earning assets ^(b)	0.93	1.11	0.46
Net yield on average interest-earning assets excluding CIB Markets	1.91 %	2.30 %	3.27 %
Noninterest revenue - reported	\$ 69,338	\$ 65,388	\$ 58,475
Fully taxable-equivalent adjustments	3,225	2,560	2,213
Noninterest revenue - managed basis	\$ 72,563	\$ 67,948	\$ 60,688
Less: CIB Markets noninterest revenue	19,151	21,109	17,792
Noninterest revenue excluding CIB Markets	\$ 53,412	\$ 46,839	\$ 42,896
Memo: CIB Markets total net revenue	\$ 27,394	\$ 29,483	\$ 20,912

(a) Interest includes the effect of related hedges. Taxable-equivalent amounts are used where applicable.

(b) Refer to pages 70-71 for further information on CIB Markets.

Calculation of certain U.S. GAAP and non-GAAP financial measures

Certain U.S. GAAP and non-GAAP financial measures are calculated as follows:

Book value per share ("BVPS")

Common stockholders' equity at period-end /
Common shares at period-end

Overhead ratio

Total noninterest expense / Total net revenue

ROA

Reported net income / Total average assets

ROE

Net income* / Average common stockholders' equity

ROTCE

Net income* / Average tangible common equity

TBVP

Tangible common equity at period-end / Common shares at period-end

* Represents net income applicable to common equity

In addition, the Firm reviews other non-GAAP measures such as

- Adjusted expense, which represents noninterest expense excluding Firmwide legal expense, and
- Pre-provision profit, which represents total net revenue less total noninterest expense.

Management believes that these measures help investors understand the effect of these items on reported results and provide an alternative presentation of the Firm's performance.

The Firm also reviews the allowance for loan losses to period-end loans retained excluding trade finance and conduits, a non-GAAP financial measure, to provide a more meaningful assessment of CIB's allowance coverage ratio.

Management's discussion and analysis

TCE, ROTCE and TBVPS

TCE, ROTCE and TBVPS are each non-GAAP financial measures. TCE represents the Firm's common stockholders' equity (i.e., total stockholders' equity less preferred stock) less goodwill and identifiable intangible assets (other than MSRs), net of related deferred tax liabilities. ROTCE measures the Firm's net income applicable to common equity as a percentage of average TCE. TBVPS represents the Firm's TCE at period-end divided by common shares at period-end. TCE, ROTCE and TBVPS are utilized by the Firm, as well as investors and analysts, in assessing the Firm's use of equity.

The following summary table provides a reconciliation from the Firm's common stockholders' equity to TCE.

(in millions, except per share and ratio data)	Period-end		Average		
	Dec 31, 2021	Dec 31, 2020	Year ended December 31,		
			2021	2020	2019
Common stockholders' equity	\$ 259,289	\$ 249,291	\$ 250,968	\$ 236,865	\$ 232,907
Less: Goodwill	50,315	49,248	49,584	47,820	47,620
Less: Other intangible assets	882	904	876	781	789
Add: Certain deferred tax liabilities ^(a)	2,499	2,453	2,474	2,399	2,328
Tangible common equity	\$ 210,591	\$ 201,592	\$ 202,982	\$ 190,663	\$ 186,826
Return on tangible common equity	NA	NA	23 %	14 %	19 %
Tangible book value per share	\$ 71.53	\$ 66.11	NA	NA	NA

(a) Represents deferred tax liabilities related to tax-deductible goodwill and to identifiable intangibles created in nontaxable transactions, which are netted against goodwill and other intangibles when calculating TCE.

BUSINESS SEGMENT RESULTS

The Firm is managed on an LOB basis. There are four major reportable business segments – Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management. In addition, there is a Corporate segment.

The business segments are determined based on the products and services provided, or the type of customer

served, and they reflect the manner in which financial information is evaluated by the Firm's Operating Committee. Segment results are presented on a managed basis. Refer to Explanation and Reconciliation of the Firm's use of Non-GAAP Financial Measures, on pages 58-60 for a definition of managed basis.

JPMorgan Chase						
Consumer Businesses			Wholesale Businesses			
Consumer & Community Banking			Corporate & Investment Bank		Commercial Banking	Asset & Wealth Management
Consumer & Business Banking	Home Lending	Card & Auto	Banking	Markets & Securities Services		
<ul style="list-style-type: none"> Consumer Banking J.P. Morgan Wealth Management Business Banking 	<ul style="list-style-type: none"> Home Lending Production Home Lending Servicing Real Estate Portfolios 	<ul style="list-style-type: none"> Credit Card Auto 	<ul style="list-style-type: none"> Investment Banking Payments^(a) Lending 	<ul style="list-style-type: none"> Fixed Income Markets Equity Markets Securities Services Credit Adjustments & Other 	<ul style="list-style-type: none"> Middle Market Banking Corporate Client Banking Commercial Real Estate Banking 	<ul style="list-style-type: none"> Asset Management Global Private Bank^(b)

(a) In the fourth quarter of 2021, the Wholesale Payments business was renamed Payments.

(b) In the first quarter of 2021, the Wealth Management business was renamed Global Private Bank.

Description of business segment reporting methodology

Results of the business segments are intended to present each segment as if it were a stand-alone business. The management reporting process that derives business segment results includes the allocation of certain income and expense items. The Firm also assesses the level of capital required for each LOB on at least an annual basis. The Firm periodically assesses the assumptions, methodologies and reporting classifications used for segment reporting, and further refinements may be implemented in future periods. The Firm's LOBs also provide various business metrics which are utilized by the Firm and its investors and analysts in assessing performance.

Revenue sharing

When business segments join efforts to sell products and services to the Firm's clients, the participating business segments may agree to share revenue from those transactions. Revenue is generally recognized in the segment responsible for the related product or service, with allocations to the other segment(s) involved in the transaction. The segment results reflect these revenue-sharing agreements.

Expense Allocation

Where business segments use services provided by corporate support units, or another business segment, the costs of those services are allocated to the respective business segments. The expense is generally allocated based on the actual cost and use of services provided. In contrast, certain costs and investments related to corporate support units, technology and operations not currently utilized by any LOB, are not allocated to the business segments and are retained in Corporate. Expense retained in Corporate generally includes costs that would not be incurred if the segments were stand-alone businesses; and other items not aligned with a particular business segment.

Funds transfer pricing

Funds transfer pricing ("FTP") is the process by which the Firm allocates interest income and expense to each business segment and transfers the primary interest rate risk and liquidity risk to Treasury and CIO within Corporate.

The funds transfer pricing process considers the interest rate and liquidity risk characteristics of assets and liabilities and off-balance sheet products. Periodically the methodology and assumptions utilized in the FTP process are adjusted to reflect economic conditions and other factors, which may impact the allocation of net interest income to the business segments.

Management's discussion and analysis

As a result of the current interest rate environment and the excess liquidity stemming from government and central bank actions since the onset of the COVID-19 pandemic, the cost of funds for assets and the credits earned for liabilities have generally declined, impacting the business segments net interest income. As such, during the period ended December 31, 2021, this has resulted in lower cost of funds for loans and margin compression on deposits across the LOBs.

Debt expense and preferred stock dividend allocation

As part of the funds transfer pricing process, almost all of the cost of the credit spread component of outstanding unsecured long-term debt and preferred stock dividends is allocated to the reportable business segments, while the balance of the cost is retained in Corporate. The methodology to allocate the cost of unsecured long-term debt and preferred stock dividends to the business segments is aligned with the relevant regulatory capital requirements, as applicable. The allocated cost of unsecured long-term debt is included in a business segment's net interest income, and net income is reduced

by preferred stock dividends to arrive at a business segment's net income applicable to common equity.

Refer to Capital Risk Management on pages 86-96 for additional information.

Capital allocation

The amount of capital assigned to each segment is referred to as equity. The Firm's allocation methodology incorporates Basel III Standardized RWA, Basel III Advanced RWA, the GSIB surcharge, and a simulation of capital in a severe stress environment. As of January 1, 2022, the Firm has changed its line of business capital allocations primarily as a result of changes in RWA for each LOB and to reflect an increase in the Firm's GSIB surcharge to 4.0% that will be effective January 1, 2023. The assumptions and methodologies used to allocate capital are periodically reassessed and as a result, the capital allocated to the LOBs may change from time to time.

Refer to Line of business equity on page 93 for additional information on capital allocation.

Segment Results - Managed Basis

The following tables summarize the Firm's results by segment for the periods indicated.

Year ended December 31, (in millions, except ratios)	Consumer & Community Banking			Corporate & Investment Bank			Commercial Banking		
	2021	2020	2019	2021	2020	2019	2021	2020	2019
Total net revenue	\$ 50,073	\$ 51,268	\$ 55,133	\$51,749	\$ 49,284	\$ 39,265	\$ 10,008	\$ 9,313	\$ 9,264
Total noninterest expense	29,256	27,990	28,276	25,325	23,538	22,444	4,041	3,798	3,735
Pre-provision profit/(loss)	20,817	23,278	26,857	26,424	25,746	16,821	5,967	5,515	5,529
Provision for credit losses	(6,989)	12,312	4,954	(1,174)	2,726	277	(947)	2,113	296
Net income/(loss)	20,930	8,217	16,541	21,134	17,094	11,954	5,246	2,578	3,958
Return on equity ("ROE")	41%	15%	31%	25 %	20%	14%	21 %	11%	17%

Year ended December 31, (in millions, except ratios)	Asset & Wealth Management			Corporate			Total		
	2021	2020	2019	2021	2020	2019	2021	2020	2019
Total net revenue	\$16,957	\$ 14,240	\$ 13,591	\$ (3,483)	\$ (1,176)	\$ 1,211	\$ 125,304	\$ 122,929	\$ 118,464
Total noninterest expense	10,919	9,957	9,747	1,802	1,373	1,067	71,343	66,656	65,269
Pre-provision profit/(loss)	6,038	4,283	3,844	(5,285)	(2,549)	144	53,961	56,273	53,195
Provision for credit losses	(227)	263	59	81	66	(1)	(9,256)	17,480	5,585
Net income/(loss)	4,737	2,992	2,867	(3,713)	(1,750)	1,111	48,334	29,131	36,431
Return on equity ("ROE")	33 %	28%	26%	NM	NM	NM	19%	12%	15%

The following sections provide a comparative discussion of the Firm's results by segment as of or for the years ended December 31, 2021 and 2020.

CONSUMER & COMMUNITY BANKING

Consumer & Community Banking offers services to consumers and businesses through bank branches, ATMs, digital (including mobile and online) and telephone banking. CCB is organized into Consumer & Business Banking (including Consumer Banking, J.P. Morgan Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card & Auto. Consumer & Business Banking offers deposit, investment and lending products, payments and services to consumers, and lending, deposit, and cash management and payment solutions to small businesses. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card & Auto issues credit cards to consumers and small businesses and originates and services auto loans and leases.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2021	2020	2019
Revenue			
Lending- and deposit-related fees	\$ 3,034	\$ 3,166	\$ 3,938
Asset management, administration and commissions	3,514	2,780	2,808
Mortgage fees and related income	2,159	3,079	2,035
Card income	3,563	3,068	3,412
All other income	5,016	5,647	5,603
Noninterest revenue	17,286	17,740	17,796
Net interest income	32,787	33,528	37,337
Total net revenue	50,073	51,268	55,133
Provision for credit losses	(6,989)	12,312	4,954
Noninterest expense			
Compensation expense	12,142	11,014	10,815
Noncompensation expense ^(a)	17,114	16,976	17,461
Total noninterest expense	29,256	27,990	28,276
Income before income tax expense	27,806	10,966	21,903
Income tax expense	6,876	2,749	5,362
Net income	\$20,930	\$ 8,217	\$16,541
Revenue by line of business			
Consumer & Business Banking	\$23,980	\$22,955	\$27,376
Home Lending	5,291	6,018	5,179
Card & Auto	20,802	22,295	22,578
Mortgage fees and related income details:			
Production revenue	2,215	2,629	1,618
Net mortgage servicing revenue ^(b)	(56)	450	417
Mortgage fees and related income	\$ 2,159	\$ 3,079	\$ 2,035
Financial ratios			
Return on equity	41 %	15 %	31 %
Overhead ratio	58	55	51

(a) Included depreciation expense on leased assets of \$3.3 billion, \$4.2 billion and \$4.0 billion for the years ended December 31, 2021, 2020 and 2019, respectively.

(b) Included MSR risk management results of \$(525) million, \$(18) million and \$(165) million for the years ended December 31, 2021, 2020 and 2019, respectively.

Management's discussion and analysis

2021 compared with 2020

Net income was \$20.9 billion, up \$12.7 billion, driven by a net benefit in the provision for credit losses, compared to an expense in the prior year.

Net revenue was \$50.1 billion, a decrease of 2%.

Net interest income was \$32.8 billion, down 2%, driven by:

- the net impact in Card of lower revolving loans, primarily due to higher payments, and lower funding costs,

largely offset by

- higher loans in Auto, and
- the accelerated recognition of deferred processing fees associated with PPP loan forgiveness, largely offset by the net impact of margin compression on higher deposits in CBB.

Noninterest revenue was \$17.3 billion, down 3%, driven by:

- a decrease in mortgage fees and related income due to a net loss in MSR risk management results primarily driven by updates to model inputs related to prepayment expectations as well as lower production margins,
- lower auto operating lease income as a result of a decline in volume, and
- lower overdraft fee revenue,

largely offset by

- higher asset management fees as a result of higher average market levels and net inflows, and
- higher card income due to higher net interchange income driven by an increase in debit and credit card sales volume above pre-pandemic levels, partially offset by the impact of a renegotiation of a co-brand partner contract, an increase to the rewards liability, and higher amortization related to new account origination costs.

Refer to Note 15 for further information regarding changes in the value of the MSR asset and related hedges, and mortgage fees and related income. Refer to Critical Accounting Estimates on pages 150-153, and Note 6 for additional information on card income.

Noninterest expense was \$29.3 billion, up 5%, reflecting:

- increased compensation expense, as well as investments in technology and marketing campaigns, and growth in travel-related benefits,

partially offset by

- lower depreciation expense due to lower auto lease assets and the impact of higher vehicle collateral values.

The provision for credit losses was a net benefit of \$7.0 billion, compared with an expense of \$12.3 billion in the prior year, driven by:

- a \$9.8 billion reduction in the allowance for credit losses, reflecting improvements in the Firm's macroeconomic outlook, consisting of \$7.6 billion in Card, \$675 million in CBB, \$300 million in Auto and \$1.2 billion in Home Lending, which also reflects continued improvements in HPI expectations, and
- lower net charge-offs predominantly in Card, as consumer cash balances remained elevated.

The prior year included a \$7.8 billion addition to the allowance for credit losses.

Refer to Credit and Investment Risk Management on pages 106-132 and Allowance for Credit Losses on pages 129-131 for a further discussion of the credit portfolios and the allowance for credit losses.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2021	2020	2019
Selected balance sheet data (period-end)			
Total assets	\$ 500,370	\$ 496,705	\$ 541,367
Loans:			
Consumer & Business Banking ^(a)	35,095	48,810	29,585
Home Lending ^(b)	180,529	182,121	213,445
Card	154,296	144,216	168,924
Auto	69,138	66,432	61,522
Total loans	439,058	441,579	473,476
Deposits	1,148,110	958,706	723,418
Equity	50,000	52,000	52,000
Selected balance sheet data (average)			
Total assets	\$ 489,771	\$ 501,584	\$ 543,127
Loans:			
Consumer & Business Banking	44,906	43,064	28,859
Home Lending ^(c)	181,049	197,148	230,662
Card	140,405	146,633	156,325
Auto	67,624	61,476	61,862
Total loans	433,984	448,321	477,708
Deposits	1,054,956	851,390	698,378
Equity	50,000	52,000	52,000
Headcount	128,863	122,894	125,756

- (a) At December 31, 2021 and 2020 included \$5.4 billion and \$19.2 billion of loans, respectively, in Business Banking under the PPP. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.
- (b) At December 31, 2021, 2020 and 2019, Home Lending loans held-for-sale and loans at fair value were \$14.9 billion, \$9.7 billion and \$16.6 billion, respectively.
- (c) Average Home Lending loans held-for sale and loans at fair value were \$15.4 billion, \$11.1 billion and \$14.1 billion for the years ended December 31, 2021, 2020 and 2019, respectively.

Selected metrics

As of or for the year ended December 31, (in millions, except ratio data)	2021	2020	2019
Credit data and quality statistics			
Nonaccrual loans ^{(a)(b)(c)}	\$4,875 ^(h)	\$5,492 ⁽ⁱ⁾	\$3,027
Net charge-offs/(recoveries)			
Consumer & Business Banking	289	263	298
Home Lending	(275)	(169)	(98)
Card	2,712	4,286	4,848
Auto	35	123	206
Total net charge-offs/ (recoveries)	\$2,761	\$4,503	\$5,254
Net charge-off/(recovery) rate			
Consumer & Business Banking ^(d)	0.64 %	0.61 %	1.03 %
Home Lending	(0.17)	(0.09)	(0.05)
Card	1.94	2.93	3.10
Auto	0.05	0.20	0.33
Total net charge-off/ (recovery) rate	0.66 %	1.03 %	1.13 %
30+ day delinquency rate ^(e)			
Home Lending ^{(f)(g)}	1.25 %	1.15 %	1.58 %
Card	1.04	1.68	1.87
Auto	0.64	0.69	0.94
90+ day delinquency rate - Card ^(e)	0.50 %	0.92 %	0.95 %
Allowance for loan losses			
Consumer & Business Banking	\$ 697	\$1,372	\$ 750
Home Lending	660	1,813	1,890
Card	10,250	17,800	5,683
Auto	733	1,042	465
Total allowance for loan losses	\$12,340	\$22,027	\$8,788

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. The adoption resulted in a change in the accounting for purchased credit-impaired ("PCI") loans, which are considered purchased credit deteriorated ("PCD") loans under CECL. Refer to Consumer Credit Portfolio on pages 110-116 and Note 12 for further information on PCD loans.

- (a) At both December 31, 2021 and 2020, nonaccrual loans included \$1.6 billion of PCD loans. Prior to the adoption of CECL, nonaccrual loans excluded PCI loans as the Firm recognized interest income on each pool of PCI loans as each of the pools was performing.
- (b) At December 31, 2021, 2020 and 2019, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of \$342 million, \$558 million and \$963 million, respectively. These amounts have been excluded based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.
- (c) At December 31, 2021 and 2020, generally excludes loans that were under payment deferral programs offered in response to the COVID-19 pandemic. Refer to Consumer Credit Portfolio on pages 110-116 for further information on consumer payment assistance activity. Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.
- (d) At December 31, 2021 and 2020, included \$5.4 billion and \$19.2 billion of loans, respectively, in Business Banking under the PPP. The Firm does not expect to realize material credit losses on PPP loans because the loans are guaranteed by the SBA. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.
- (e) At December 31, 2021 and 2020, the principal balance of loans in Home Lending, Card and Auto under payment deferral programs offered in response to the COVID-19 pandemic were as follows: (1) \$1.1 billion and \$9.1 billion in Home Lending, respectively; (2) \$46 million and \$264 million in Card, respectively; and (3) \$115 million

Management's discussion and analysis

and \$376 million in Auto, respectively. Loans that are performing according to their modified terms are generally not considered delinquent. Refer to Consumer Credit Portfolio on pages 110-116 for further information on consumer payment assistance activity.

- (f) At December 31, 2021 and 2020, the 30+ day delinquency rates included PCD loans. The rate at December 31, 2019 was revised to include the impact of PCI loans.
- (g) At December 31, 2021, 2020 and 2019, excluded mortgage loans insured by U.S. government agencies of \$405 million, \$744 million and \$1.7 billion, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.
- (h) At December 31, 2021, nonaccrual loans excluded \$506 million of PPP loans 90 or more days past due and guaranteed by the SBA.
- (i) Prior-period amount has been revised to conform with the current presentation.

Selected metrics

As of or for the year ended December 31, (in billions, except ratios and where otherwise noted)	2021	2020	2019
Business Metrics			
CCB households (in millions)	66.3	63.4	62.6
Number of branches	4,790	4,908	4,976
Active digital customers (in thousands) ^(a)	58,857	55,274	52,453
Active mobile customers (in thousands) ^(b)	45,452	40,899	37,315
Debit and credit card sales volume	\$1,360.7	\$1,081.2	\$1,114.4
Consumer & Business Banking			
Average deposits	\$1,035.4	\$ 832.5	\$ 683.7
Deposit margin	1.27 %	1.58 %	2.48 %
Business banking origination volume ^(c)	\$ 13.9	\$ 26.6	\$ 6.6
Client investment assets ^(d)	718.1	590.2	501.4
Number of client advisors	4,725	4,417	4,196
Home Lending			
Mortgage origination volume by channel			
Retail	\$ 91.8	\$ 72.9	\$ 51.0
Correspondent	70.9	40.9	54.2
Total mortgage origination volume^(e)	\$ 162.7	\$ 113.8	\$ 105.2
Third-party mortgage loans serviced (period-end)	\$ 519.2	\$ 447.3	\$ 520.8
MSR carrying value (period-end)	5.5	3.3	4.7
Ratio of MSR carrying value (period-end) to third-party mortgage loans serviced (period-end)	1.06 %	0.74 %	0.90 %
MSR revenue multiple ^(f)	3.93x	2.55x	2.65x
Credit Card			
Credit card sales volume, excluding commercial card (in millions)	\$ 893.5	\$ 702.7	\$ 762.8
New accounts opened	8.0	5.4	7.8
Net revenue rate	10.51 %	10.92 %	10.48 %
Auto			
Loan and lease origination volume	\$ 43.6	\$ 38.4	\$ 34.0
Average auto operating lease assets	19.1	22.0	21.6

- (a) Users of all web and/or mobile platforms who have logged in within the past 90 days.
- (b) Users of all mobile platforms who have logged in within the past 90 days.
- (c) Included origination volume under the PPP of \$10.6 billion and \$21.9 billion for the years ended December 31, 2021 and 2020, respectively. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.
- (d) Includes assets invested in managed accounts and J.P. Morgan mutual funds where AWM is the investment manager. Refer to AWM segment results on pages 76-78 for additional information.
- (e) Firmwide mortgage origination volume was \$182.4 billion, \$133.4 billion and \$115.9 billion for the years ended December 31, 2021, 2020 and 2019, respectively.
- (f) Represents the ratio of MSR carrying value (period-end) to third-party mortgage loans serviced (period-end) divided by the ratio of annualized loan servicing-related revenue to third-party mortgage loans serviced (average).

CORPORATE & INVESTMENT BANK

The Corporate & Investment Bank, which consists of Banking and Markets & Securities Services, offers a broad suite of investment banking, market-making, prime brokerage, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, merchants, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Payments, which provides payments services enabling clients to manage payments and receipts globally, and cross-border financing. Markets & Securities Services includes Markets, a global market-maker across products, including cash and derivative instruments, which also offers sophisticated risk management solutions, prime brokerage, and research. Markets & Securities Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2021	2020	2019
Financial ratios			
Return on equity	25 %	20 %	14 %
Overhead ratio	49	48	57
Compensation expense as percentage of total net revenue	25	24	28
Revenue by business			
Investment Banking	\$12,506	\$ 8,871	\$ 7,215
Payments ^(a)	6,270	5,560	5,842
Lending	1,001	1,146	1,021
Total Banking	19,777	15,577	14,078
Fixed Income Markets	16,865	20,878	14,418
Equity Markets	10,529	8,605	6,494
Securities Services	4,328	4,253	4,154
Credit Adjustments & Other ^(b)	250	(29)	121
Total Markets & Securities Services	31,972	33,707	25,187
Total net revenue	\$51,749	\$49,284	\$39,265

- (a) In the fourth quarter of 2021, the Wholesale Payments business was renamed Payments.
- (b) Consists primarily of centrally managed credit valuation adjustments ("CVA"), funding valuation adjustments ("FVA") on derivatives, other valuation adjustments, and certain components of fair value option elected liabilities, which are primarily reported in principal transactions revenue. Results are presented net of associated hedging activities and net of CVA and FVA amounts allocated to Fixed Income Markets and Equity Markets. Refer to Notes 2, 3 and 24 for additional information.

Selected income statement data

Year ended December 31, (in millions)	2021	2020	2019
Revenue			
Investment banking fees	\$ 13,359	\$ 9,477	\$ 7,575
Principal transactions	15,764	17,560	14,399
Lending- and deposit-related fees	2,514	2,070	1,668
Asset management, administration and commissions	5,024	4,721	4,400
All other income	1,548	1,292	2,018
Noninterest revenue	38,209	35,120	30,060
Net interest income	13,540	14,164	9,205
Total net revenue^(a)	51,749	49,284	39,265
Provision for credit losses	(1,174)	2,726	277
Noninterest expense			
Compensation expense	13,096	11,612	11,180
Noncompensation expense	12,229	11,926	11,264
Total noninterest expense	25,325	23,538	22,444
Income before income tax expense	27,598	23,020	16,544
Income tax expense	6,464	5,926	4,590
Net income	\$ 21,134	\$ 17,094	\$ 11,954

- (a) Includes tax-equivalent adjustments, predominantly due to income tax credits and other tax benefits related to alternative energy investments; income tax credits and amortization of the cost of investments in affordable housing projects; and tax-exempt income from municipal bonds of \$3.0 billion, \$2.4 billion and \$1.9 billion for the years ended December 31, 2021, 2020 and 2019, respectively. Prior-period tax-equivalent adjustment amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Management's discussion and analysis

2021 compared with 2020

Net income was \$21.1 billion, up 24%, largely driven by a net benefit in the provision for credit losses, compared to an expense in the prior year.

Net revenue was \$51.7 billion, up 5%.

Banking revenue was \$19.8 billion, up 27%.

- Investment Banking revenue was \$12.5 billion, up 41%, driven by higher Investment Banking fees, reflecting higher fees across products. The Firm ranked #1 for Global Investment Banking fees, according to Dealogic.
 - Advisory fees were \$4.4 billion, up 85%, driven by increased M&A activity and wallet share gains.
 - Equity underwriting fees were \$4.0 billion, up 43%, driven by a strong IPO market and wallet share gains.
 - Debt underwriting fees were \$5.0 billion, up 15%, predominantly driven by an active leveraged loan market primarily related to acquisition financing.
- Payments revenue was \$6.3 billion, up 13%, and included net gains on equity investments. Excluding these net gains, revenue was \$5.8 billion, up 5%, driven by higher deposit balances and fees, largely offset by deposit margin compression.
- Lending revenue was \$1.0 billion, down 13%, predominantly driven by lower net interest income, largely offset by lower fair value losses on hedges of accrual loans, and higher loan commitment fees.

Markets & Securities Services revenue was \$32.0 billion, down 5%. Markets revenue was \$27.4 billion, down 7%.

- Fixed Income Markets revenue was \$16.9 billion, down 19%, driven by lower revenue in Rates, Currencies & Emerging Markets, Fixed Income Financing, Commodities and Credit compared to a strong prior year, partially offset by higher revenue in Securitized Products.
- Equity Markets revenue was \$10.5 billion, up 22%, driven by strong performance across prime brokerage, derivatives and Cash Equities.
- Securities Services revenue was \$4.3 billion, up 2%, driven by growth in fees and deposits, predominantly offset by deposit margin compression.
- Credit Adjustments & Other was a gain of \$250 million predominantly driven by valuation adjustments related to derivatives.

Noninterest expense was \$25.3 billion, up 8%, predominantly driven by higher compensation expense, including revenue-related compensation and investments, as well as higher volume-related brokerage expense, partially offset by lower legal expense.

The provision for credit losses was a net benefit of \$1.2 billion, driven by a net reduction in the allowance for credit losses, compared with an expense of \$2.7 billion in the prior year.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2021	2020	2019
Selected balance sheet data (period-end)			
Total assets ^(a)	\$1,259,896	\$1,095,926	\$913,803
Loans:			
Loans retained ^(b)	159,786	133,296	121,733
Loans held-for-sale and loans at fair value ^(c)	50,386	39,588	34,317
Total loans	210,172	172,884	156,050
Equity	83,000	80,000	80,000
Selected balance sheet data (average)			
Total assets ^(a)	\$1,334,518	\$1,121,942	\$992,770
Trading assets-debt and equity instruments	448,099	425,060 ^(e)	376,182
Trading assets-derivative receivables	68,203	69,243 ^(e)	48,196
Loans:			
Loans retained ^(b)	145,137	135,676	122,371
Loans held-for-sale and loans at fair value ^(c)	51,072	33,792	32,884
Total loans	196,209	169,468	155,255
Equity	83,000	80,000	80,000
Headcount^(d)	67,546	61,733	60,013

- (a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.
- (b) Includes secured lending-related positions, credit portfolio loans, loans held by consolidated Firm-administered multi-seller conduits, trade finance loans, other held-for-investment loans and overdrafts.
- (c) Primarily reflects lending-related positions originated and purchased in CIB Markets, including loans held for securitization.
- (d) During the six months ended June 30, 2021, 1,155 technology and risk management employees were transferred from Corporate to CIB.
- (e) Prior-period amounts have been revised to conform with the current presentation.

Selected metrics

As of or for the year ended December 31, (in millions, except ratios)	2021	2020	2019
Credit data and quality statistics			
Net charge-offs/ (recoveries)	\$ 6	\$ 370	\$ 183
Nonperforming assets:			
Nonaccrual loans:			
Nonaccrual loans retained ^(a)	584	1,008	308
Nonaccrual loans held- for-sale and loans at fair value ^(b)	844	1,662	644
Total nonaccrual loans	1,428	2,670	952
Derivative receivables	316	56	30
Assets acquired in loan satisfactions	91	85	70
Total nonperforming assets	1,835	2,811	1,052
Allowance for credit losses:			
Allowance for loan losses	1,348	2,366	1,202
Allowance for lending- related commitments	1,372	1,534	848
Total allowance for credit losses	2,720	3,900	2,050
Net charge-off/(recovery) rate ^(c)	– %	0.27 %	0.15 %
Allowance for loan losses to period-end loans retained	0.84	1.77	0.99
Allowance for loan losses to period-end loans retained, excluding trade finance and conduits ^(d)	1.12	2.54	1.31
Allowance for loan losses to nonaccrual loans retained ^(a)	231	235	390
Nonaccrual loans to total period-end loans	0.68	1.54	0.61

- (a) Allowance for loan losses of \$58 million, \$278 million and \$110 million were held against these nonaccrual loans at December 31, 2021, 2020 and 2019, respectively.
- (b) At December 31, 2021, 2020 and 2019, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of \$281 million, \$316 million and \$127 million, respectively. These amounts have been excluded based upon the government guarantee.
- (c) Loans held-for-sale and loans at fair value were excluded when calculating the net charge-off/(recovery) rate.
- (d) Management uses allowance for loan losses to period-end loans retained, excluding trade finance and conduits, a non-GAAP financial measure, to provide a more meaningful assessment of CIB's allowance coverage ratio.

Management's discussion and analysis

Investment banking fees

(in millions)	Year ended December 31,		
	2021	2020	2019
Advisory	\$ 4,381	\$ 2,368	\$ 2,377
Equity underwriting	3,953	2,758	1,666
Debt underwriting ^(a)	5,025	4,351	3,532
Total investment banking fees	\$ 13,359	\$ 9,477	\$ 7,575

(a) Represents long-term debt and loan syndications.

League table results - wallet share

Year ended December 31,	2021		2020		2019	
	Rank	Share	Rank	Share	Rank	Share
Based on fees ^(a)						
M&A^(b)						
Global	# 2	10.2 %	# 2	9.0 %	# 2	9.0 %
U.S.	2	11.3	2	9.5	2	9.3
Equity and equity-related^(c)						
Global	2	8.9	2	8.9	1	9.4
U.S.	2	11.8	2	12.0	1	13.5
Long-term debt^(d)						
Global	1	8.4	1	8.8	1	7.8
U.S.	1	12.1	1	12.8	1	12.0
Loan syndications						
Global	1	10.9	1	11.1	1	10.1
U.S.	1	12.6	1	12.3	1	12.4
Global investment banking fees^(e)	# 1	9.5 %	# 1	9.2 %	# 1	8.9 %

(a) Source: Dealogic as of January 3, 2022. Reflects the ranking of revenue wallet and market share.

(b) Global M&A excludes any withdrawn transactions. U.S. M&A revenue wallet represents wallet from client parents based in the U.S.

(c) Global equity and equity-related ranking includes rights offerings and Chinese A-Shares.

(d) Long-term debt rankings include investment-grade, high-yield, supranationals, sovereigns, agencies, covered bonds, asset-backed securities ("ABS") and mortgage-backed securities ("MBS"); and exclude money market, short-term debt, and U.S. municipal securities.

(e) Global investment banking fees exclude money market, short-term debt and shelf securities.

Markets revenue

The following table summarizes selected income statement data for the Markets businesses. Markets includes both Fixed Income Markets and Equity Markets. Markets revenue consists of principal transactions, fees, commissions and other income, as well as net interest income. The Firm assesses its Markets business performance on a total revenue basis, as offsets may occur across revenue line items. For example, securities that generate net interest income may be risk-managed by derivatives that are reflected at fair value in principal transactions revenue. Refer to Notes 6 and 7 for a description of the composition of these income statement line items.

Principal transactions reflects revenue on financial instruments and commodities transactions that arise from client-driven market-making activity. Principal transactions revenue includes amounts recognized upon executing new transactions with market participants, as well as "inventory-related revenue", which is revenue recognized from gains and losses on derivatives and other instruments that the Firm has been holding in anticipation of, or in response to, client demand, and changes in the fair value of instruments used by the Firm to actively manage the risk exposure arising from such inventory. Principal transactions revenue recognized upon executing new transactions with market participants is affected by many factors including the level of client activity, the bid-offer spread (which is the

difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa), market liquidity and volatility. These factors are interrelated and sensitive to the same factors that drive inventory-related revenue, which include general market conditions, such as interest rates, foreign exchange rates, credit spreads, and equity and commodity prices, as well as other macroeconomic conditions.

For the periods presented below, the predominant source of principal transactions revenue was the amount recognized upon executing new transactions.

Year ended December 31, (in millions, except where otherwise noted)	2021			2020			2019		
	Fixed Income Markets	Equity Markets	Total Markets	Fixed Income Markets	Equity Markets	Total Markets	Fixed Income Markets	Equity Markets	Total Markets
Principal transactions	\$ 7,911	\$ 7,519	\$ 15,430	\$ 11,857	\$ 6,087	\$ 17,944	\$ 8,786	\$ 5,739	\$ 14,525
Lending- and deposit-related fees	321	17	338	226	10	236	198	7	205
Asset management, administration and commissions	545	1,967	2,512	411	2,087	2,498	407	1,775	2,182
All other income	972	(101)	871	493	(62)	431	872	8	880
Noninterest revenue	9,749	9,402	19,151	12,987	8,122	21,109	10,263	7,529	17,792
Net interest income	7,116	1,127	8,243	7,891	483	8,374	4,155	(1,035)	3,120
Total net revenue	\$ 16,865	\$ 10,529	\$ 27,394	\$ 20,878	\$ 8,605	\$ 29,483	\$ 14,418	\$ 6,494	\$ 20,912
Loss days^(a)			4			4			1

(a) Loss days represent the number of days for which CIB Markets, which consists of Fixed Income Markets and Equity Markets, posted losses to total net revenue. The loss days determined under this measure differ from the measure used to determine backtesting gains and losses. Daily backtesting gains and losses include positions in the Firm's Risk Management value-at-risk ("VaR") measure and exclude select components of total net revenue, which may more than offset backtesting gains or losses on a particular day. For more information on daily backtesting gains and losses, refer to the VaR discussion on pages 135-137.

Selected metrics

As of or for the year ended December 31, (in millions, except where otherwise noted)	2021	2020	2019
Assets under custody ("AUC") by asset class (period-end) (in billions):			
Fixed Income	\$ 16,098	\$ 15,840	\$ 13,498
Equity	12,962	11,489	10,100
Other ^(a)	4,161	3,651	3,233
Total AUC	\$ 33,221	\$ 30,980	\$ 26,831
Merchant processing volume (in billions) ^(b)	\$ 1,886.7	\$ 1,597.3	\$ 1,511.5
Client deposits and other third party liabilities (average) ^(c)	\$ 714,910	\$ 610,555	\$ 464,795

(a) Consists of mutual funds, unit investment trusts, currencies, annuities, insurance contracts, options and other contracts.

(b) Represents total merchant processing volume across CIB, CCB and CB.

(c) Client deposits and other third-party liabilities pertain to the Payments and Securities Services businesses.

Management's discussion and analysis

International metrics

As of or for the year ended December 31, (in millions, except where otherwise noted)	2021	2020	2019
Total net revenue^(a)			
Europe/Middle East/Africa	\$ 13,954	\$ 13,872	\$ 11,905
Asia-Pacific	7,555	7,524	5,319
Latin America/Caribbean	1,833	1,931	1,543
Total international net revenue	23,342	23,327	18,767
North America	28,407	25,957	20,498
Total net revenue	\$ 51,749	\$ 49,284	\$ 39,265
Loans retained (period-end)^(a)			
Europe/Middle East/Africa	\$ 33,084	\$ 27,659	\$ 26,067
Asia-Pacific	14,471	12,802	14,759
Latin America/Caribbean	7,006	5,425	6,173
Total international loans	54,561	45,886	46,999
North America	105,225	87,410	74,734
Total loans retained	\$ 159,786	\$ 133,296	\$ 121,733
Client deposits and other third-party liabilities (average)^(b)			
Europe/Middle East/Africa	\$ 243,867	\$ 211,592	\$ 174,477
Asia-Pacific	132,241	124,145	90,364
Latin America/Caribbean	46,045	37,664	29,024
Total international	\$ 422,153	\$ 373,401	\$ 293,865
North America	292,757	237,154	170,930
Total client deposits and other third-party liabilities	\$ 714,910	\$ 610,555	\$ 464,795
AUC (period-end)^(b) (in billions)			
North America	\$ 21,655	\$ 20,028	\$ 16,855
All other regions	11,566	10,952	9,976
Total AUC	\$ 33,221	\$ 30,980	\$ 26,831

(a) Total net revenue and loans retained (excluding loans held-for-sale and loans at fair value) are based on the location of the trading desk, booking location, or domicile of the client, as applicable.

(b) Client deposits and other third-party liabilities pertaining to the Payments and Securities Services businesses, and AUC, are based on the domicile of the client.

COMMERCIAL BANKING

Commercial Banking provides comprehensive financial solutions, including lending, payments, investment banking and asset management products across three primary client segments: Middle Market Banking, Corporate Client Banking and Commercial Real Estate Banking. Other includes amounts not aligned with a primary client segment.

Middle Market Banking covers small and mid-sized companies, local governments and nonprofit clients.

Corporate Client Banking covers large corporations.

Commercial Real Estate Banking covers investors, developers, and owners of multifamily, office, retail, industrial and affordable housing properties.

2021 compared with 2020

Net income was \$5.2 billion, up \$2.7 billion, predominantly driven by a net benefit in the provision for credit losses, compared to an expense in the prior year.

Net revenue was \$10.0 billion, up 7%. Net interest income was \$6.0 billion, down 3%, driven by the net impact of margin compression on higher deposits and a decrease in loans, largely offset by lower funding costs. Noninterest revenue was \$3.9 billion, up 28%, predominantly driven by higher investment banking and payments revenue.

Noninterest expense was \$4.0 billion, up 6%, predominantly driven by investments in the business, including higher compensation expense, and higher volume- and revenue-related expense.

The provision for credit losses was a net benefit of \$947 million, driven by a net reduction in the allowance for credit losses, compared with an expense of \$2.1 billion in the prior year.

Selected income statement data

Year ended December 31, (in millions)	2021	2020	2019
Revenue			
Lending- and deposit-related fees	\$ 1,392	\$ 1,187	\$ 941
All other income	2,537	1,880	1,769
Noninterest revenue	3,929	3,067	2,710
Net interest income	6,079	6,246	6,554
Total net revenue^(a)	10,008	9,313	9,264
Provision for credit losses	(947)	2,113	296
Noninterest expense			
Compensation expense	1,973	1,854	1,785
Noncompensation expense	2,068	1,944	1,950
Total noninterest expense	4,041	3,798	3,735
Income before income tax expense	6,914	3,402	5,233
Income tax expense	1,668	824	1,275
Net income	\$ 5,246	\$ 2,578	\$ 3,958

(a) Total net revenue included tax-equivalent adjustments from income tax credits related to equity investments in designated community development entities and in entities established for rehabilitation of historic properties, as well as tax-exempt income related to municipal financing activities, of \$330 million, \$350 million and \$460 million for the years ended December 31, 2021, 2020 and 2019, respectively. Prior-period tax-equivalent adjustment amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Management's discussion and analysis

CB product revenue consists of the following:

Lending includes a variety of financing alternatives, which are primarily provided on a secured basis; collateral includes receivables, inventory, equipment, real estate or other assets. Products include term loans, revolving lines of credit, bridge financing, asset-based structures, leases, and standby letters of credit.

Payments includes revenue from a broad range of products and services that enable CB clients to manage payments and receipts, as well as invest and manage funds.

Investment banking includes revenue from a range of products providing CB clients with sophisticated capital-raising alternatives, as well as balance sheet and risk management tools through advisory, equity underwriting, and loan syndications. Revenue from Fixed Income and Equity Markets products used by CB clients is also included.

Other revenue primarily includes tax-equivalent adjustments generated from Community Development Banking and activity derived from principal transactions.

Selected income statement data (continued)

Year ended December 31, (in millions, except ratios)	2021	2020	2019
Revenue by product			
Lending	\$ 4,629	\$ 4,396	\$ 4,057
Payments	3,653	3,715	4,200
Investment banking ^(a)	1,611	1,069	919
Other	115	133	88
Total Commercial Banking net revenue	\$ 10,008	\$ 9,313	\$ 9,264
Investment banking revenue, gross ^(b)	\$ 5,092	\$ 3,348	\$ 2,744
Revenue by client segment			
Middle Market Banking	\$ 4,004	\$ 3,640	\$ 3,805
Corporate Client Banking	3,508	3,203	3,119
Commercial Real Estate Banking	2,419	2,313	2,169
Other	77	157	171
Total Commercial Banking net revenue	\$ 10,008	\$ 9,313	\$ 9,264
Financial ratios			
Return on equity	21 %	11 %	17 %
Overhead ratio	40	41	40

(a) Includes CB's share of revenue from investment banking products sold to CB clients through the CIB.

(b) Refer to Business Segment Results page 61 for a discussion of revenue sharing.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2021	2020	2019
Selected balance sheet data (period-end)			
Total assets	\$ 230,776	\$ 228,911 ^(b)	\$ 220,514
Loans:			
Loans retained	206,220	207,880	207,287
Loans held-for-sale and loans at fair value	2,223	2,245	1,009
Total loans	\$ 208,443	\$ 210,125	\$ 208,296
Equity	24,000	22,000	22,000
Period-end loans by client segment			
Middle Market Banking ^(a)	\$ 61,159	\$ 61,115	\$ 54,188
Corporate Client Banking	45,315	47,420	51,165
Commercial Real Estate Banking	101,751	101,146	101,951
Other	218	444	992
Total Commercial Banking loans^(a)	\$ 208,443	\$ 210,125	\$ 208,296
Selected balance sheet data (average)			
Total assets	\$ 225,548	\$ 233,156 ^(b)	\$ 218,896
Loans:			
Loans retained	201,920	217,767	206,837
Loans held-for-sale and loans at fair value	3,122	1,129	1,082
Total loans	\$ 205,042	\$ 218,896	\$ 207,919
Client deposits and other third-party liabilities	301,502	237,825	172,734
Equity	24,000	22,000	22,000
Average loans by client segment			
Middle Market Banking	\$ 60,128	\$ 61,558	\$ 55,690
Corporate Client Banking	44,361	54,172	50,360
Commercial Real Estate Banking	100,331	102,479	100,884
Other	222	687	985
Total Commercial Banking loans	\$ 205,042	\$ 218,896	\$ 207,919
Headcount	12,902	11,675	11,629

(a) At December 31, 2021 and 2020, total loans included \$1.2 billion and \$6.6 billion of loans under the PPP, of which \$1.1 billion and \$6.4 billion were in Middle Market Banking, respectively. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.

(b) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Selected metrics

As of or for the year ended December 31, (in millions, except ratios)	2021	2020	2019
Credit data and quality statistics			
Net charge-offs/(recoveries)	\$ 71	\$ 401	\$ 160
Nonperforming assets			
Nonaccrual loans:			
Nonaccrual loans retained ^(a)	740	^(c) 1,286	498
Nonaccrual loans held-for-sale and loans at fair value	—	120	—
Total nonaccrual loans	740	1,406	498
Assets acquired in loan satisfactions	17	24	25
Total nonperforming assets	757	1,430	523
Allowance for credit losses:			
Allowance for loan losses	2,219	3,335	2,780
Allowance for lending-related commitments	749	651	293
Total allowance for credit losses	2,968	3,986	3,073
Net charge-off/(recovery) rate ^(b)	0.04 %	0.18 %	0.08 %
Allowance for loan losses to period-end loans retained	1.08	1.60	1.34
Allowance for loan losses to nonaccrual loans retained ^(a)	300	259	558
Nonaccrual loans to period-end total loans	0.36	0.67	0.24

(a) Allowance for loan losses of \$124 million, \$273 million and \$114 million was held against nonaccrual loans retained at December 31, 2021, 2020 and 2019, respectively.

(b) Loans held-for-sale and loans at fair value were excluded when calculating the net charge-off/(recovery) rate.

(c) At December 31, 2021, nonaccrual loans excluded \$114 million of PPP loans 90 or more days past due and guaranteed by the SBA.

Management's discussion and analysis

ASSET & WEALTH MANAGEMENT

Asset & Wealth Management, with client assets of \$4.3 trillion, is a global leader in investment and wealth management.

Asset Management

Offers multi-asset investment management solutions across equities, fixed income, alternatives and money market funds to institutional and retail investors providing for a broad range of clients' investment needs.

Global Private Bank

Provides retirement products and services, brokerage, custody, trusts and estates, loans, mortgages, deposits and investment management to high net worth clients.

The majority of AWM's client assets are in actively managed portfolios.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2021	2020	2019
Revenue			
Asset management, administration and commissions	\$12,333	\$10,610	\$ 9,818
All other income	738	212	418
Noninterest revenue	13,071	10,822	10,236
Net interest income	3,886	3,418	3,355
Total net revenue	16,957	14,240	13,591
Provision for credit losses	(227)	263	59
Noninterest expense			
Compensation expense	5,692	4,959	5,028
Noncompensation expense	5,227	4,998	4,719
Total noninterest expense	10,919	9,957	9,747
Income before income tax expense	6,265	4,020	3,785
Income tax expense	1,528	1,028	918
Net income	\$ 4,737	\$ 2,992	\$ 2,867
Revenue by line of business			
Asset Management	\$ 9,246	\$ 7,654	\$ 7,254
Global Private Bank ^(a)	7,711	6,586	6,337
Total net revenue	\$16,957	\$14,240	\$13,591
Financial ratios			
Return on equity	33 %	28 %	26 %
Overhead ratio	64	70	72
Pre-tax margin ratio:			
Asset Management	35	29	26
Global Private Bank ^(a)	39	27	30
Asset & Wealth Management	37	28	28

(a) In the first quarter of 2021, the Wealth Management business was renamed Global Private Bank.

2021 compared with 2020

Net income was \$4.7 billion, an increase of 58%.

Net revenue was \$17.0 billion, an increase of 19%. Net interest income was \$3.9 billion, up 14%. Noninterest revenue was \$13.1 billion, up 21%.

Revenue from Asset Management was \$9.2 billion, up 21%, predominantly driven by:

- higher asset management fees, net of liquidity fee waivers, on higher average market levels and strong cumulative net inflows into long-term and liquidity products,
- higher performance fees, and
- higher net investment valuation gains.

Revenue from Global Private Bank was \$7.7 billion, up 17%, predominantly driven by:

- higher loans including the impact of lower funding costs, and higher asset management fees,
- partially offset by
- the net impact of margin compression on higher deposits.

The provision for credit losses was a net benefit of \$227 million, driven by a reduction in the allowance for credit losses, compared with an expense of \$263 million in the prior year.

Noninterest expense was \$10.9 billion, up 10%, driven by higher volume- and revenue-related compensation expense and distribution fees, higher structural expense, and higher investments in the business, partially offset by lower legal expense.

Asset Management has two high-level measures of its overall fund performance.

Effective September 2021, AWM changed the source for the peer group quartile rankings of its funds from Lipper to Morningstar for U.S.-domiciled funds (except for “Municipals” and “Investor” funds, for which the source remains Lipper) and Taiwan domiciled funds. AWM evaluates fund performance utilizing this peer group ranking and believes that it provides investors with comparability across the industry. This change resulted in both positive and negative impacts on the quartile rankings for prior periods, as compared to how they would have been ranked by Lipper. In addition, AWM has changed its selection of the “primary share class” for certain non-U.S. funds, as set forth below, in order to establish a more consistent approach across these products. Prior periods in the following table have been revised to conform to the current presentation.

• **Percentage of mutual fund assets under management in funds rated 4- or 5-star:** Mutual fund rating services rank funds based on their risk adjusted performance over various periods. A 5-star rating is the best rating and represents the top 10% of industry-wide ranked funds. A 4-star rating represents the next 22.5% of industry-wide ranked funds. A 3-star rating represents the next 35% of industry-wide ranked funds. A 2-star rating represents the next 22.5% of industry-wide ranked funds. A 1-star rating is the worst rating and represents the bottom 10% of industrywide ranked funds. An overall Morningstar rating is derived from a weighted average of the performance associated with a fund’s three-, five and ten-year (if applicable) Morningstar Rating metrics. For U.S.-domiciled funds, separate star ratings are provided at the individual share class level. The Nomura “star rating” is based on three-year risk-adjusted performance only. Funds with fewer than three years of history are not rated and hence excluded from these rankings. All ratings, the assigned peer categories and the asset values used to derive these rankings are sourced from the applicable fund rating provider. Where applicable, the fund rating providers redenominate asset values into U.S. dollars. The percentage of AUM is based on star ratings at the share class level for U.S.-domiciled funds, and at a “primary share class” level to represent the star rating of all other funds, except for Japan, for which Nomura provides ratings at the fund level. The performance data may have been different if all share classes had been included. Past performance is not indicative of future results.

• **Percentage of mutual fund assets under management in funds ranked in the 1st or 2nd quartile (one, three and five years):**All quartile rankings, the assigned peer categories and the asset values used to derive these rankings are sourced from the fund rating providers. Quartile rankings are based on the net-of-fee absolute return of each fund. Where applicable, the fund rating providers redenominate asset values into U.S. dollars. The percentage of AUM is based on fund performance and associated peer rankings at the share class level for U.S.-domiciled funds, at a “primary share class” level to represent the quartile ranking for U.K., Luxembourg and Hong Kong SAR funds and at the fund level for all other funds. The performance data may have been different if all share classes had been included. Past performance is not indicative of future results.

“**Primary share class**” means the C share class for European funds and Acc share class for Hong Kong SAR and Taiwan funds. If these share classes are not available, the oldest share class is used as the primary share class.

Selected metrics

As of or for the year ended December 31, (in millions, except ranking data, ratios and headcount)	2021	2020	2019
% of JPM mutual fund assets rated as 4- or 5-star ^(a)	69 %	63 %	66 %
% of JPM mutual fund assets ranked in 1 st or 2 nd quartile: ^(b)			
1 year	53	63	59
3 years	72	69	74
5 years	80	72	75

Selected balance sheet data (period-end)^(c)

Total assets	\$234,425	\$203,384	\$173,175
Loans	218,271	186,608	158,149
Deposits	282,052	198,755	142,740
Equity	14,000	10,500	10,500

Selected balance sheet data (average)^(c)

Total assets	\$217,187	\$181,432	\$161,863
Loans	198,487	166,311	147,404
Deposits	230,296	161,955	135,265
Equity	14,000	10,500	10,500

Headcount	22,762	20,683	21,550
Number of Global Private Bank client advisors	2,738	2,462	2,419

Credit data and quality statistics^(c)

Net charge-offs/(recoveries)	\$ 26	\$ (14)	\$ 29
Nonaccrual loans	708	964 ^(d)	115
Allowance for credit losses:			
Allowance for loan losses	\$ 365	\$ 598	\$ 350
Allowance for lending- related commitments	18	38	19
Total allowance for credit losses	\$ 383	\$ 636	\$ 369
Net charge-off/(recovery) rate	0.01 %	(0.01)%	0.02 %
Allowance for loan losses to period-end loans	0.17	0.32	0.22
Allowance for loan losses to nonaccrual loans	52	62 ^(d)	304
Nonaccrual loans to period- end loans	0.32	0.52 ^(d)	0.07

- (a) Represents the Morningstar Rating for all domiciled funds except for Japan domiciled funds which use Nomura. Includes only Asset Management retail open-ended mutual funds that have a rating. Excludes money market funds, Undiscovered Managers Fund, and Brazil domiciled funds. Prior-period amounts were revised to conform with the current period presentation.
- (b) Quartile ranking sourced from Morningstar, Lipper and Nomura based on country of domicile. Includes only Asset Management retail open-ended mutual funds that are ranked by the aforementioned sources. Excludes money market funds, Undiscovered Managers Fund, and Brazil domiciled funds. Prior-period amounts were revised to conform with the current period presentation.
- (c) Loans, deposits and related credit data and quality statistics relate to the Global Private Bank business.
- (d) Prior-period amount has been revised to conform with the current presentation.

Management's discussion and analysis

Client assets

2021 compared with 2020

Client assets were \$4.3 trillion, an increase of 18%. Assets under management were \$3.1 trillion, an increase of 15% driven by cumulative net inflows and the impact of higher market levels.

Client assets

December 31, (in billions)	2021	2020	2019
Assets by asset class			
Liquidity	\$ 708	\$ 641	\$ 539
Fixed income	693	671	591
Equity	779	595	463
Multi-asset	732	656	596
Alternatives	201	153	139
Total assets under management	3,113	2,716	2,328
Custody/brokerage/ administration/deposits	1,182	936	761
Total client assets^(a)	\$ 4,295	\$ 3,652	\$ 3,089

Assets by client segment

Private Banking	\$ 805	\$ 689	\$ 628
Global Institutional ^(b)	1,430	1,273	1,081
Global Funds ^(b)	878	754	619
Total assets under management	\$ 3,113	\$ 2,716	\$ 2,328
Private Banking	\$ 1,931	\$ 1,581	\$ 1,359
Global Institutional ^(b)	1,479	1,311	1,106
Global Funds ^(b)	885	760	624
Total client assets^(a)	\$ 4,295	\$ 3,652	\$ 3,089

(a) Includes CCB client investment assets invested in managed accounts and J.P. Morgan mutual funds where AWM is the investment manager.

(b) In the first quarter of 2021, Institutional and Retail client segments were renamed to Global Institutional and Global Funds, respectively. This did not result in a change to the clients within either client segment.

Client assets (continued)

Year ended December 31, (in billions)	2021	2020	2019
Assets under management rollforward			
Beginning balance	\$ 2,716	\$ 2,328	\$ 1,958
Net asset flows:			
Liquidity	68	104	61
Fixed income	36	48	104
Equity	85	33	(11)
Multi-asset	17	5	2
Alternatives	26	6	2
Market/performance/other impacts	165	192	212
Ending balance, December 31	\$ 3,113	\$ 2,716	\$ 2,328
Client assets rollforward			
Beginning balance	\$ 3,652	\$ 3,089	\$ 2,619
Net asset flows:			
Market/performance/other impacts	254	287	294
Ending balance, December 31	\$ 4,295	\$ 3,652	\$ 3,089

International metrics

Year ended December 31, (in billions, except where otherwise noted)	2021	2020	2019
Total net revenue (in millions)^(a)			
Europe/Middle East/Africa	\$ 3,571	\$ 2,956	\$ 2,869
Asia-Pacific	2,017	1,665	1,509
Latin America/Caribbean	886	782	724
Total international net revenue	6,474	5,403	5,102
North America	10,483	8,837	8,489
Total net revenue	\$ 16,957	\$ 14,240	\$ 13,591
Assets under management			
Europe/Middle East/Africa	\$ 561	\$ 517	\$ 428
Asia-Pacific	254	224	192
Latin America/Caribbean	79	70	62
Total international assets under management	894	811	682
North America	2,219	1,905	1,646
Total assets under management	\$ 3,113	\$ 2,716	\$ 2,328
Client assets			
Europe/Middle East/Africa	\$ 687	\$ 622	\$ 520
Asia-Pacific	381	330	272
Latin America/Caribbean	195	166	147
Total international client assets	1,263	1,118	939
North America	3,032	2,534	2,150
Total client assets	\$ 4,295	\$ 3,652	\$ 3,089

(a) Regional revenue is based on the domicile of the client.

The Corporate segment consists of Treasury and Chief Investment Office and Other Corporate, which includes corporate staff functions and expense that is centrally managed. Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The major Other Corporate functions include Real Estate, Technology, Legal, Corporate Finance, Human Resources, Internal Audit, Risk Management, Compliance, Control Management, Corporate Responsibility and various Other Corporate groups.

Selected income statement and balance sheet data

Year ended December 31, (in millions, except headcount)	2021	2020	2019
Revenue			
Principal transactions	\$ 187	\$ 245	\$ (461)
Investment securities gains/ (losses)	(345)	795	258
All other income	226	159	89
Noninterest revenue	68	1,199	(114)
Net interest income	(3,551)	(2,375)	1,325
Total net revenue^(a)	(3,483)	(1,176)	1,211
Provision for credit losses	81	66	(1)
Noninterest expense	1,802	1,373	1,067
Income/(loss) before income tax expense/(benefit)	(5,366)	(2,615)	145
Income tax expense/(benefit)	(1,653)	(865)	(966)
Net income/(loss)	\$ (3,713)	\$ (1,750)	\$ 1,111
Total net revenue			
Treasury and CIO	(3,464)	(1,368)	2,032
Other Corporate	(19)	192	(821)
Total net revenue	\$ (3,483)	\$ (1,176)	\$ 1,211
Net income/(loss)			
Treasury and CIO	(3,057)	(1,403)	1,394
Other Corporate	(656)	(347)	(283)
Total net income/(loss)	\$ (3,713)	\$ (1,750)	\$ 1,111
Total assets (period-end)	\$1,518,100	\$1,359,831	\$ 837,618
Loans (period-end)	1,770	1,657	1,649
Headcount^(b)	38,952	38,366	38,033

(a) Included tax-equivalent adjustments, driven by tax-exempt income from municipal bonds, of \$257 million, \$241 million and \$314 million for the years ended December 31, 2021, 2020 and 2019, respectively.

(b) During the six months ended June 30, 2021, 1,155 technology and risk management employees were transferred from Corporate to CIB.

2021 compared with 2020

Net income was a loss of \$3.7 billion compared with a loss of \$1.8 billion in the prior year.

Net revenue was a loss of \$3.5 billion, compared with a loss of \$1.2 billion in the prior year.

Net interest income decreased primarily driven by:

- limited opportunities to deploy funds in response to significant deposit growth across the LOBs, and
- the impact of faster prepayments on mortgage-backed securities in the first half of 2021,

partially offset by

- higher net interest income on growth in investment securities.

Noninterest revenue decreased primarily due to:

- net investment securities losses related to repositioning the investment securities portfolio, compared with net gains in the prior year from sales of U.S. GSE and government agency MBS,
- lower net valuation gains on several legacy equity investments

partially offset by

- the absence of losses recorded in the prior year in Treasury and CIO related to cash deployment transactions, which were more than offset by the related net interest income earned on these transactions, also in the prior year, and
- the absence of losses recorded in the prior year related to the early termination of certain of the Firm's long-term debt in Treasury and CIO

Noninterest expense of \$1.8 billion was up \$429 million primarily due to a higher contribution to the Firm's Foundation, investments related to the Firm's international consumer expansion, technology initiatives, and higher legal expense, largely offset by the absence of an impairment on a legacy investment recorded in the prior year.

Refer to Note 10 and Note 13 for additional information on the investment securities portfolio and the allowance for credit losses.

The current period income tax benefit was driven by changes in the level and mix of income and expenses subject to U.S. federal and state and local taxes as well as other tax adjustments, partially offset by the resolutions of certain tax audits.

Management's discussion and analysis

Treasury and CIO overview

Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The risks managed by Treasury and CIO arise from the activities undertaken by the Firm's four major reportable business segments to serve their respective client bases, which generate both on- and off-balance sheet assets and liabilities.

Treasury and CIO seek to achieve the Firm's asset-liability management objectives generally by investing in high-quality securities that are managed for the longer-term as part of the Firm's investment securities portfolio. Treasury and CIO also use derivatives to meet the Firm's asset-liability management objectives. Refer to Note 5 for further information on derivatives. In addition, Treasury and CIO manage the Firm's cash position primarily through deposits at central banks and investments in short-term instruments. Refer to Liquidity Risk Management on pages 97-104 for further information on liquidity and funding risk. Refer to Market Risk Management on pages 133-140 for information on interest rate, foreign exchange and other risks.

The investment securities portfolio predominantly consists of U.S. GSE and government agency and nonagency mortgage-backed securities, U.S. and non-U.S. government securities, obligations of U.S. states and municipalities, other ABS and corporate debt securities. At December 31, 2021, the Treasury and CIO investment securities portfolio, net of allowance for credit losses, was \$670.1 billion, and the average credit rating of the securities comprising the portfolio was AA+ (based upon external ratings where available and, where not available, based primarily upon internal risk ratings). Refer to Note 10 for further information on the Firm's investment securities portfolio and internal risk ratings.

Selected income statement and balance sheet data

As of or for the year ended December 31, (in millions)	2021	2020	2019
Investment securities gains/ (losses)	\$ (345)	\$ 795	\$ 258
Available-for-sale securities (average)	\$ 306,827	\$ 413,367	\$ 283,205
Held-to-maturity securities (average) ^(a)	285,086	94,569	34,939
Investment securities portfolio (average)	\$ 591,913	\$ 507,936	\$ 318,144
Available-for-sale securities (period-end)	\$ 306,352	\$ 386,065	\$ 348,876
Held-to-maturity securities, net of allowance for credit losses (period-end) ^(a)	363,707	201,821	47,540
Investment securities portfolio, net of allowance for credit losses (period-end) ^(b)	\$ 670,059	\$ 587,886	\$ 396,416

(a) During 2021 and 2020, the Firm transferred \$104.5 billion and \$164.2 billion of investment securities, respectively, from AFS to HTM for capital management purposes.

(b) At December 31, 2021, and 2020, the allowance for credit losses on investment securities was \$42 million and \$78 million, respectively.

Refer to Note 10 for further information.

FIRMWIDE RISK MANAGEMENT

Risk is an inherent part of JPMorgan Chase's business activities. When the Firm extends a consumer or wholesale loan, advises customers and clients on their investment decisions, makes markets in securities, or offers other products or services, the Firm takes on some degree of risk. The Firm's overall objective is to manage its businesses, and the associated risks, in a manner that balances serving the interests of its clients, customers and investors and protects the safety and soundness of the Firm.

The Firm believes that effective risk management requires, among other things:

- Acceptance of responsibility, including identification and escalation of risks by all individuals within the Firm;
- Ownership of risk identification, assessment, data and management within each of the LOBs and Corporate; and
- Firmwide structures for risk governance.

The Firm follows a disciplined and balanced compensation framework with strong internal governance and independent oversight by the Board of Directors (the "Board"). The impact of risk and control issues is carefully considered in the Firm's performance evaluation and incentive compensation processes.

Risk governance and oversight framework

The Firm's risk management governance and oversight framework involves understanding drivers of risks, types of risks, and impacts of risks.



Drivers of Risks are factors that cause a risk to exist. Drivers of risks include the economic environment, regulatory and government policy, competitor and market evolution, business decisions, process and judgment error, deliberate wrongdoing, dysfunctional markets, and natural disasters.

Types of Risks are categories by which risks manifest themselves. Risks are generally categorized in the following four risk types:

- Strategic risk is the risk to earnings, capital, liquidity or reputation associated with poorly designed or failed business plans or inadequate response to changes in the operating environment.
- Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments, including

consumer credit risk, wholesale credit risk, and investment portfolio risk.

- Market risk is the risk associated with the effect of changes in market factors, such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.
- Operational risk is the risk associated with an adverse outcome resulting from inadequate or failed internal processes or systems; human factors; or external events impacting the Firm's processes or systems. It includes compliance, conduct, legal, and estimations and model risk.

Impacts of Risks are consequences of risks, both quantitative and qualitative. There may be many consequences of risks manifesting, including quantitative impacts such as a reduction in earnings and capital, liquidity outflows, and fines or penalties, or qualitative impacts such as reputation damage, loss of clients and customers, and regulatory and enforcement actions.

The Firm's risk governance and oversight framework is managed on a Firmwide basis. The Firm has an Independent Risk Management ("IRM") function, which consists of the Risk Management and Compliance organizations. The Chief Executive Officer ("CEO") appoints, subject to approval by the Risk Committee of the Board ("Board Risk Committee"), the Firm's Chief Risk Officer ("CRO") to lead the IRM organization and manage the risk governance structure of the Firm. The framework is subject to approval by the Board Risk Committee in the form of the Risk Governance and Oversight Policy. The Firm's CRO oversees and delegates authorities to LOB CROs, Firmwide Risk Executives ("FREs"), and the Firm's Chief Compliance Officer ("CCO"), who each establish Risk Management and Compliance organizations, set the Firm's risk governance policies and standards, and define and oversee the implementation of the Firm's risk governance. The LOB CROs are responsible for risks that arise in their LOBs, while FREs oversee risk areas that span across the individual LOBs, functions and regions.

Three lines of defense

The Firm relies upon each area of the Firm giving rise to risk to operate within the parameters identified by the IRM function, and within its own management-identified risk and control standards.

Each LOB and Treasury & CIO, including their aligned Operations, Technology and Control Management, are the Firm's "first line of defense" and own the identification of risks, as well as the design and execution of controls to manage those risks. The first line of defense is responsible for adherence to applicable laws, rules and regulations and for the implementation of the risk management structure (which may include policy, standards, limits, thresholds and controls) established by IRM.

Management's discussion and analysis

The IRM function is independent of the businesses and is the Firm's "second line of defense." The IRM function independently assesses and challenges the first line of defense risk management practices. IRM is also responsible for its own adherence to applicable laws, rules and regulations and for the implementation of policies and standards established by IRM with respect to its own processes.

Internal Audit is an independent function that provides objective assessment on the adequacy and effectiveness of Firmwide processes, controls, governance and risk management as the "third line of defense." The Internal Audit Function is headed by the General Auditor, who reports to the Audit Committee and administratively to the CEO.

In addition, there are other functions that contribute to the Firmwide control environment but are not considered part of a particular line of defense, including Finance, Human Resources and Legal, and are responsible for adherence to applicable laws, rules and regulations and policies and standards established by IRM with respect to their own processes.

Risk identification and ownership

Each LOB and Corporate owns the ongoing identification of risks, as well as the design and execution of controls, including IRM-specified controls, to manage those risks. To support this activity, the Firm has a formal Risk Identification framework designed to facilitate each LOB and Corporate's responsibility to identify material risks inherent to the Firm, catalog them in a central repository and review the most material risks on a regular basis. The IRM function reviews and challenges the LOB and Corporate's identified risks, maintains the central repository and provides the consolidated Firmwide results to the Firmwide Risk Committee ("FRC") and Board Risk Committee.

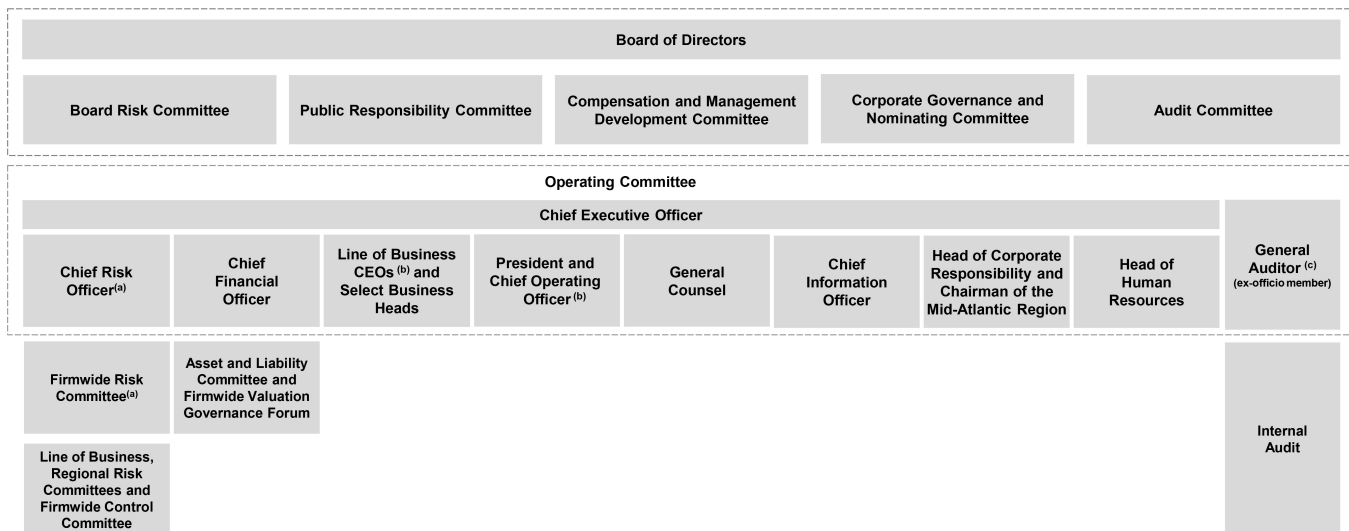
Risk appetite

The Firm's overall appetite for risk is governed by "Risk Appetite" frameworks for quantitative and qualitative risks. Periodically the Firm's risk appetite is set and approved by senior management (including the CEO and CRO) and approved by the Board Risk Committee. Quantitative and qualitative risks are assessed to monitor and measure the Firm's capacity to take risk consistent with its stated risk appetite. Risk appetite results are reported to the Board Risk Committee.

Risk governance and oversight structure

The independent status of the IRM function is supported by a governance structure that provides for escalation of risk issues to senior management, the FRC, and the Board of Directors, as appropriate.

The chart below illustrates the committees of the Board of Directors and key senior management-level committees in the Firm's risk governance structure. In addition, there are other committees, forums and paths of escalation that support the oversight of risk which are not shown in the chart below or described in this Form 10-K.



^(a) The CRO may escalate directly to the Board Risk Committee. The Firmwide Risk Committee escalates significant issues directly to the Board Risk Committee as appropriate.

^(b) The CEO of the Corporate & Investment Bank is also the Firm's sole President and Chief Operating Officer following the retirement of the Firm's Co-President and Co-Chief Operating Officer on December 31, 2021.

^(c) The General Auditor reports to the Audit Committee and administratively to the CEO.

The Firm's Operating Committee, which consists of the Firm's CEO, CRO, CFO, General Counsel, CEOs of the LOBs and other senior executives, is accountable to and may refer matters to the Firm's Board of Directors. The Operating Committee is responsible for escalating to the Board the information necessary to facilitate the Board's exercise of its duties.

Board oversight

The Firm's Board of Directors actively oversees the business and affairs of the Firm. This includes monitoring the Firm's financial performance and condition and reviewing the strategic objectives and plans of the Firm. The Board carries out a significant portion of its oversight responsibilities through its independent, principal standing committees. The Board Risk Committee is the principal committee that oversees risk matters. The Audit Committee oversees the control environment, and the Compensation & Management Development Committee oversees compensation and other management-related matters. Each committee of the Board oversees reputational risks and conduct risks within its scope of responsibility.

The JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of management of the bank. The JPMorgan Chase Bank, N.A. Board accomplishes this function acting directly and through the principal standing committees of the Firm's Board of Directors. Risk and control oversight on behalf of JPMorgan Chase Bank N.A. is primarily the responsibility of the Risk Committee and the

Audit Committee, respectively, and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee.

The Board Risk Committee assists the Board in its oversight of management's responsibility to implement a global risk management framework reasonably designed to identify, assess and manage the Firm's risks. The Board Risk Committee's responsibilities include approval of applicable primary risk policies and review of certain associated frameworks, analysis and reporting established by management. Breaches in risk appetite and parameters, issues that may have a material adverse impact on the Firm, including capital and liquidity issues, and other significant risk-related matters are escalated to the Board Risk Committee, as appropriate.

The Audit Committee assists the Board in its oversight of management's responsibility to ensure that there is an effective system of controls reasonably designed to safeguard the Firm's assets and income, ensure the integrity of the Firm's financial statements, and maintain compliance with the Firm's ethical standards, policies, plans and procedures, and with laws and regulations. It also assists the Board in its oversight of the Firm's independent registered public accounting firm's qualifications, independence and performance, and of the performance of the Firm's Internal Audit function.

Management’s discussion and analysis

The Compensation & Management Development Committee (“CMDC”) assists the Board in its oversight of the Firm’s compensation principles and practices. The CMDC reviews and approves the Firm’s compensation and qualified benefits programs. The Committee reviews the performance of Operating Committee members against their goals, and approves their compensation awards. In addition, the CEO’s award is subject to ratification by the independent directors of the Board. The CMDC also reviews the development of and succession for key executives. As part of the Board’s role of reinforcing, demonstrating and communicating the “tone at the top”, the CMDC provides oversight of the Firm’s culture, including reviewing updates from management regarding significant conduct issues and any related actions with respect to employees, including compensation actions.

The Public Responsibility Committee provides oversight and review of the Firm’s positions and practices on public responsibility matters such as community investment, fair lending, sustainability, consumer practices and other public policy issues that reflect the Firm’s values and character and could impact the Firm’s reputation among its stakeholders. The Committee also provides guidance on these matters to management and the Board, as appropriate.

The Corporate Governance & Nominating Committee exercises general oversight with respect to the governance of the Board of Directors. It reviews the qualifications of and recommends to the Board of Directors proposed nominees for election to the Board. The Committee evaluates and recommends to the Board corporate governance practices applicable to the Firm. It also appraises the framework for assessing the Board’s performance and self-evaluation.

Management oversight

The Firm’s senior management-level committees that are primarily responsible for key risk-related functions include:

The Firmwide Risk Committee (“FRC”) is the Firm’s highest management-level risk committee. It provides oversight of the risks inherent in the Firm’s businesses and serves as an escalation point for risk topics and issues raised by underlying committees and/or FRC members.

The Firmwide Control Committee (“FCC”) is an escalation committee for senior management to review and discuss the Firmwide operational risk environment including identified issues, operational risk metrics and significant events that have been escalated.

Line of Business and Regional Risk Committees are responsible for providing oversight of the governance, limits, and controls that are in place within the scope of their respective activities. These committees review the ways in which the particular LOB or the business operating in a particular region could be exposed to adverse outcomes with a focus on identifying, accepting, escalating and/or requiring remediation of matters brought to these committees.

Line of Business and Corporate Function Control Committees oversee the operational risk and control environment of their respective business or function, inclusive of Operational Risk, Compliance and Conduct Risks. As part of that mandate, they are responsible for reviewing indicators of elevated or emerging risks and other data that may impact the level of operating risk in a business or function, addressing key operational risk issues, with an emphasis on processes with control concerns and overseeing control remediation.

The Asset and Liability Committee (“ALCO”) is responsible for overseeing the Firm’s asset and liability management (“ALM”), including the activities and frameworks supporting the management of liquidity risk, balance sheet, interest rate risk, and capital risk.

The Firmwide Valuation Governance Forum (“VGF”) is composed of senior finance and risk executives and is responsible for overseeing the management of risks arising from valuation activities conducted across the Firm.

Risk governance and oversight functions

The Firm manages its risk through risk governance and oversight functions. The scope of a particular function may include one or more drivers, types and/or impacts of risk. For example, Country Risk Management oversees country risk which may be a driver of risk or an aggregation of exposures that could give rise to multiple risk types such as credit or market risk.

The following sections discuss the risk governance and oversight functions in place to manage the risks inherent in the Firm’s business activities.

Risk governance and oversight functions	Page
Strategic Risk	85
Capital risk	86-96
Liquidity risk	97-104
Reputation risk	105
Consumer Credit Risk	110-116
Wholesale credit risk	117-128
Investment portfolio risk	132
Market risk	133-140
Country risk	141-142
Operational risk	143-149
Compliance Risk	146
Conduct risk	147
Legal risk	148
Estimations and Model risk	149

STRATEGIC RISK MANAGEMENT

Strategic risk is the risk to earnings, capital, liquidity or reputation associated with poorly designed or failed business plans or inadequate response to changes in the operating environment.

Management and oversight

The Operating Committee and the senior leadership of each LOB and Corporate are responsible for managing the Firm's most significant strategic risks. Strategic risks are overseen by IRM through participation in relevant business reviews, LOB and Corporate senior management meetings, risk and control committees and other relevant governance forums and ongoing discussions. The Board of Directors oversees management's strategic decisions, and the Board Risk Committee oversees IRM and the Firm's risk management framework.

In the process of developing business plans and strategic initiatives, LOB and Corporate senior management identify the associated risks that are incorporated into the Firmwide Risk Identification process and their impact on risk appetite.

In addition, IRM conducts a qualitative assessment of the LOB and Corporate strategic initiatives to assess their impact on the risk profile of the Firm.

The Firm's strategic planning process, which includes the development and execution of strategic initiatives, is one component of managing the Firm's strategic risk. Guided by the Firm's How We Do Business Principles (the "Principles"), the Operating Committee and senior management teams in each LOB and Corporate review and update the strategic plan periodically. The process includes evaluating the high-level strategic framework and performance against prior-year initiatives, assessing the operating environment, refining existing strategies and developing new strategies.

These strategic initiatives, along with IRM's assessment, are incorporated in the Firm's budget and provided to the Board as part of its review and approval of the Firm's strategic plan.

The Firm's balance sheet strategy, which focuses on risk-adjusted returns, strong capital and robust liquidity, is also a component in the management of strategic risk. Refer to Capital Risk Management on pages 86-96 for further information on capital risk. Refer to Liquidity Risk Management on pages 97-104 for further information on liquidity risk. Refer to Reputation Risk Management on page 105 for further information on reputation risk.

CAPITAL RISK MANAGEMENT

Capital risk is the risk the Firm has an insufficient level or composition of capital to support the Firm's business activities and associated risks during normal economic environments and under stressed conditions.

A strong capital position is essential to the Firm's business strategy and competitive position. Maintaining a strong balance sheet to manage through economic volatility is considered a strategic imperative of the Firm's Board of Directors, CEO and Operating Committee. The Firm's fortress balance sheet philosophy focuses on risk-adjusted returns, strong capital and robust liquidity. The Firm's capital risk management strategy focuses on maintaining long-term stability to enable the Firm to build and invest in market-leading businesses, including in highly stressed environments. Senior management considers the implications on the Firm's capital prior to making significant decisions that could impact future business activities. In addition to considering the Firm's earnings outlook, senior management evaluates all sources and uses of capital with a view to ensuring the Firm's capital strength.

Capital management oversight

The Firm has a Capital Management Oversight function whose primary objective is to provide independent oversight of capital risk across the Firm.

Capital Management Oversight's responsibilities include:

- Defining, monitoring and reporting capital risk metrics;
- Establishing, calibrating and monitoring capital risk limits and indicators, including capital risk appetite;
- Developing a process to classify, monitor and report capital limit breaches;
- Performing an assessment of the Firm's capital management activities, including changes made to the Contingency Capital Plan described below; and
- Conducting assessments of the Firm's regulatory capital framework intended to ensure compliance with applicable regulatory capital rules.

Capital management

Treasury & CIO is responsible for capital management.

The primary objectives of the Firm's capital management are to:

- Maintain sufficient capital in order to continue to build and invest in the Firm's businesses through the cycle and in stressed environments;
- Retain flexibility to take advantage of future investment opportunities;
- Promote the Firm's ability to serve as a source of strength to its subsidiaries;
- Ensure the Firm operates above the minimum regulatory capital ratios as well as maintain "well-capitalized" status for the Firm and its insured depository institution ("IDI") subsidiaries at all times under applicable regulatory capital requirements;

- Meet capital distribution objectives; and
- Maintain sufficient capital resources to operate throughout a resolution period in accordance with the Firm's preferred resolution strategy.

The Firm addresses these objectives through:

- Establishing internal minimum capital requirements and maintaining a strong capital governance framework. The internal minimum capital levels consider the Firm's regulatory capital requirements as well as an internal assessment of capital adequacy, in normal economic cycles and in stress events;
- Retaining flexibility in order to react to a range of potential events; and
- Regular monitoring of the Firm's capital position and following prescribed escalation protocols, both at the Firm and material legal entity levels.

Governance

Committees responsible for overseeing the Firm's capital management include the Capital Governance Committee, the ALCO as well as LOB and regional ALCOs, and the CIO, Treasury and Corporate ("CTC") Risk Committee. In addition, the Board Risk Committee periodically reviews the Firm's capital risk tolerance. Refer to Firmwide Risk Management on pages 81-84 for additional discussion on the ALCO and other risk-related committees.

Capital planning and stress testing

Comprehensive Capital Analysis and Review

The Federal Reserve requires large Bank Holding Companies ("BHCs"), including the Firm, to submit at least annually a capital plan that has been reviewed and approved by the Board of Directors. The Federal Reserve uses CCAR and other stress testing processes to ensure that large BHCs have sufficient capital during periods of economic and financial stress, and have robust, forward-looking capital assessment and planning processes in place that address each BHC's unique risks to enable it to absorb losses under certain stress scenarios. Through CCAR, the Federal Reserve evaluates each BHC's capital adequacy and internal capital adequacy assessment processes ("ICAAP"), as well as its plans to make capital distributions, such as dividend payments or stock repurchases. The Federal Reserve uses results under the severely adverse scenario from its supervisory stress test to determine each firm's Stress Capital Buffer ("SCB") requirement for the coming year.

On June 28, 2021, JPMorgan Chase announced that it had completed the 2021 CCAR stress test process. On August 5, 2021, the Federal Reserve affirmed the Firm's 2021 SCB requirement of 3.2% (down from 3.3%) and the Firm's Standardized CET1 capital ratio requirement including regulatory buffers, of 11.2% (down from 11.3%). The 2021 SCB requirement became effective on October 1, 2021 and will remain in effect until September 30, 2022.

Refer to Capital actions on page 94 for information on actions taken by the Firm's Board of Directors following the 2021 CCAR results.

Internal Capital Adequacy Assessment Process

Annually, the Firm prepares the ICAAP, which informs the Board of Directors of the ongoing assessment of the Firm's processes for managing the sources and uses of capital as well as compliance with supervisory expectations for capital planning and capital adequacy. The Firm's ICAAP integrates stress testing protocols with capital planning. The Firm's Audit Committee is responsible for reviewing and approving the capital stress testing control framework.

Stress testing assesses the potential impact of alternative economic and business scenarios on the Firm's earnings and capital. Economic scenarios, and the parameters underlying those scenarios, are defined centrally and applied uniformly across the businesses. These scenarios are articulated in terms of macroeconomic factors, which are key drivers of business results; global market shocks, which generate short-term but severe trading losses; and idiosyncratic operational risk events. The scenarios are intended to capture and stress key vulnerabilities and idiosyncratic risks facing the Firm. In addition to CCAR and other periodic stress testing, management also considers tailored stress scenarios and sensitivity analyses, as necessary.

Contingency Capital Plan

The Firm's Contingency Capital Plan establishes the capital management framework for the Firm and specifies the principles underlying the Firm's approach towards capital management in normal economic conditions and during stress. The Contingency Capital Plan defines how the Firm calibrates its targeted capital levels and meets minimum capital requirements, monitors the ongoing appropriateness of planned capital distributions, and sets out the capital contingency actions that are expected to be taken or considered at various levels of capital depletion during a period of stress.

Regulatory capital

The Federal Reserve establishes capital requirements, including well-capitalized standards, for the consolidated financial holding company. The OCC establishes similar minimum capital requirements and standards for the Firm's IDI subsidiaries, including JPMorgan Chase Bank, N.A. The U.S. capital requirements generally follow the Capital Accord of the Basel Committee, as amended from time to time.

Basel III Overview

The capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for large and internationally active U.S. BHCs and banks, including the Firm and its IDI subsidiaries, including JPMorgan Chase Bank, N.A. The minimum amount of regulatory capital that must be held by BHCs and banks is determined by calculating risk-weighted assets ("RWA"), which are on-balance sheet assets and off-balance sheet exposures,

weighted according to risk. Two comprehensive approaches are prescribed for calculating RWA: a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). For each of the risk-based capital ratios, the capital adequacy of the Firm is evaluated against the lower of the Standardized or Advanced approaches compared to their respective regulatory capital ratio requirements. The Firm's Basel III Standardized-risk-based ratios are currently more binding than the Basel III Advanced-risk-based ratios.

Basel III establishes capital requirements for calculating credit risk RWA and market risk RWA, and in the case of Basel III Advanced, operational risk RWA. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced. In addition to the RWA calculated under these approaches, the Firm may supplement such amounts to incorporate management judgment and feedback from its regulators.

Basel III also includes a requirement for Advanced Approaches banking organizations, including the Firm, to calculate the SLR. The Firm's SLR is currently more binding than the Basel III Standardized-risk-based ratios. Refer to SLR on page 93 for additional information.

COVID-19 Pandemic

The Firm has been impacted by market events as a result of the COVID-19 pandemic, but has remained well-capitalized.

Key Regulatory Developments

CECL regulatory capital transition. The Firm elected to apply the CECL capital transition provisions as permitted by the federal banking agencies which delayed the effects of CECL on regulatory capital for two years until January 1, 2022, followed by a three-year transition period ("CECL capital transition provisions").

As of December 31, 2021, the capital metrics of the Firm reflected the benefit of the CECL capital transition provisions of \$2.9 billion, which will be phased in at 25% per year beginning January 1, 2022.

The CECL capital transition provisions have also been incorporated into Tier 2 capital, adjusted average assets, and total leverage exposure and are also subject to the three-year transition period beginning January 1, 2022.

Refer to Note 1 for further information on the CECL accounting guidance.

Paycheck Protection Program. The federal banking agencies issued a final rule in September 2020 to neutralize the regulatory capital effects of participating in the PPP on risk-based capital ratios by applying a zero percent risk weight to loans originated under the program. The Firm does not

Management's discussion and analysis

expect to realize material credit losses on PPP loans because the loans are guaranteed by the SBA. As of December 31, 2021, the Firm had \$6.7 billion of loans remaining under the program.

Total leverage exposure for purposes of calculating the SLR includes PPP loans as the Firm did not participate in the Federal Reserve's Paycheck Protection Program Lending Facility, which would have allowed the Firm to exclude them under the final rule.

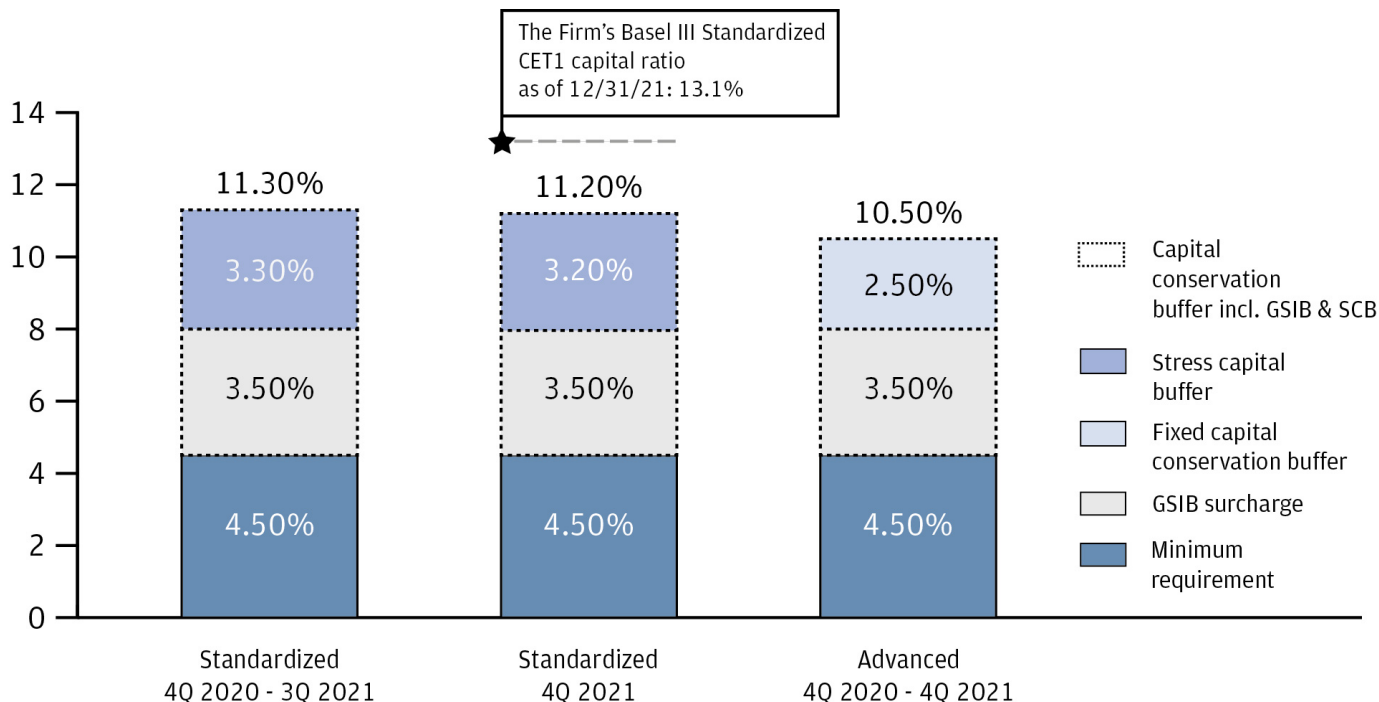
TLAC Holdings rule. On October 20, 2020, the federal banking agencies issued a final rule prescribing the regulatory capital treatment for holdings of Total Loss-Absorbing Capacity ("TLAC") debt instruments by certain large banking organizations, such as the Firm and JPMorgan Chase Bank, N.A. This rule expanded the scope of the prior capital deductions rule relating to the holdings of capital instruments of financial institutions to also include TLAC debt instruments issued by systemically important banking organizations. The final rule became effective April 1, 2021 and did not have a material impact on the Firm's risk-based capital metrics.

Standardized Approach for Counterparty Credit Risk. In November 2019, the U.S. banking regulators adopted a rule implementing "Standardized Approach for Counterparty Credit Risk" ("SA-CCR"), which replaced the current exposure method used to measure derivatives counterparty exposure under Standardized approach RWA, as well as leverage exposure used to calculate the SLR in the regulatory capital framework. The rule applies to Basel III Advanced Approaches banking organizations, such as the Firm and JPMorgan Chase Bank, N.A., with a mandatory compliance date of January 1, 2022.

Based on the derivatives exposure as of December 31, 2021, the adoption of SA-CCR is estimated to increase the Firm's Standardized RWA by approximately \$40 billion and result in a modest decrease in its total leverage exposure. These estimates may differ from the actual impact based on the composition of the Firm's derivatives exposure as of March 31, 2022.

Risk-based Capital Regulatory Requirements

The following chart presents the Firm’s Basel III CET1 capital ratio requirements under the Basel III rules currently in effect.



All banking institutions are currently required to have a minimum CET1 capital ratio of 4.5% of risk-weighted assets.

Certain banking organizations, including the Firm, are required to hold additional levels of capital to serve as a “capital conservation buffer”. The capital conservation buffer incorporates a global systemically important bank (“GSIB”) surcharge, a discretionary countercyclical capital buffer and a fixed capital conservation buffer of 2.5% for Advanced regulatory capital requirements and a variable SCB requirement, floored at 2.5%, for Standardized regulatory capital requirements.

Under the Federal Reserve’s GSIB rule, the Firm is required to assess its GSIB surcharge on an annual basis under two separately prescribed methods based on data for the previous fiscal year-end, and is subject to the higher of the two. “Method 1”, reflects the GSIB surcharge as prescribed by the Basel Committee’s assessment methodology, and is calculated by the Financial Stability Board (“FSB”) across five criteria: size, cross-jurisdictional activity, interconnectedness, complexity and substitutability. “Method 2”, calculated by the Firm, modifies the Method 1 requirements to include a measure of short-term wholesale funding in place of substitutability, and introduces a GSIB score “multiplication factor”.

Management's discussion and analysis

The following table presents the Firm's effective GSIB surcharge for the years ended December 31, 2021 and 2020. For 2022, the Firm's effective GSIB surcharge under both Method 1 and Method 2 remains unchanged at 2.0% and 3.5%, respectively.

	2022	2021	2020
Method 1	2.0 %	2.0 %	2.5 %
Method 2	3.5 %	3.5 %	3.5 %

On November 23, 2021, the FSB released its annual GSIB list based upon data as of December 31, 2020, which announced the Firm's Method 1 GSIB surcharge of 2.5% (up from 2.0%) effective January 1, 2023, unless the Firm's Method 1 GSIB surcharge, as determined by the FSB, is lower based upon data as of December 31, 2021.

The Firm's Method 2 surcharge calculated using data as of December 31, 2020 is 4.0%, which will be effective January 1, 2023. The Firm's estimated Method 2 surcharge calculated using data as of December 31, 2021 is 4.5%. Accordingly, based on the GSIB rule currently in effect, the Firm's effective GSIB surcharge is expected to increase to 4.5% on January 1, 2024 unless the Firm's Method 2 GSIB surcharge calculation based upon data as of December 31, 2022 is lower.

The U.S. federal regulatory capital standards include a framework for setting a discretionary countercyclical capital buffer taking into account the macro financial environment in which large, internationally active banks function. As of December 31, 2021, the U.S. countercyclical capital buffer remained at 0%. The Federal Reserve will continue to review the buffer at least annually. The buffer can be increased if the Federal Reserve, FDIC and OCC determine that systemic risks are meaningfully above normal and can be calibrated up to an additional 2.5% of RWA subject to a 12-month implementation period.

Failure to maintain regulatory capital equal to or in excess of the risk-based regulatory capital minimum plus the capital conservation buffer (inclusive of the GSIB surcharge) and any countercyclical buffer will result in limitations to the amount of capital that the Firm may distribute, such as through dividends and common share repurchases, as well as certain executive discretionary bonus payments.

The Firm believes that it will operate with a Basel III Standardized CET1 capital ratio between 12.0% and 13.0% in the near term, based on the Basel III capital rules currently in effect, and with consideration for an increase in the GSIB surcharge in 2023.

Total Loss-Absorbing Capacity

The Federal Reserve's TLAC rule requires the U.S. GSIB top-tier holding companies, including the Firm, to maintain minimum levels of external TLAC and eligible long-term debt ("eligible LTD"). Refer to TLAC on page 95 for additional information.

Leverage-based Capital Regulatory Requirements Supplementary leverage ratio

Banking organizations subject to the Basel III Advanced approach are currently required to have a minimum SLR of 3.0%. Certain banking organizations, including the Firm, are also required to hold an additional 2.0% leverage buffer.

The SLR is defined as Tier 1 capital under Basel III divided by the Firm's total leverage exposure. Total leverage exposure is calculated by taking the Firm's total average on-balance sheet assets, less amounts permitted to be deducted for Tier 1 capital, and adding certain off-balance sheet exposures, such as undrawn commitments and derivatives potential future exposure.

Failure to maintain an SLR equal to or greater than the regulatory requirement will result in limitations on the amount of capital that the Firm may distribute such as through dividends and common share repurchases, as well as on certain executive discretionary bonus payments.

Other regulatory capital

In addition to meeting the capital ratio requirements of Basel III, the Firm and its IDI subsidiaries must also maintain minimum capital and leverage ratios in order to be "well-capitalized" under the regulations issued by the Federal Reserve and the Prompt Corrective Action ("PCA") requirements of the FDIC Improvement Act ("FDICIA"), respectively. Refer to Note 27 for additional information.

Additional information regarding the Firm's capital ratios, as well as the U.S. federal regulatory capital standards to which the Firm is subject, is presented in Note 27. Refer to the Firm's Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website, for further information on the Firm's Basel III measures.

The following tables present the Firm's risk-based capital metrics under both the Basel III Standardized and Advanced approaches and leverage-based capital metrics.

(in millions, except ratios)	Standardized			Advanced		
	December 31, 2021 ^(a)	December 31, 2020 ^(a)	Capital ratio requirements ^(b)	December 31, 2021 ^(a)	December 31, 2020 ^(a)	Capital ratio requirements ^(b)
Risk-based capital metrics:						
CET1 capital	\$ 213,942	\$ 205,078		\$ 213,942	\$ 205,078	
Tier 1 capital	246,162	234,844		246,162	234,844	
Total capital	274,900	269,923		265,796	257,228	
Risk-weighted assets	1,638,900	1,560,609		1,547,920	1,484,431	
CET1 capital ratio	13.1 %	13.1 %	11.2 %	13.8 %	13.8 %	10.5 %
Tier 1 capital ratio	15.0	15.0	12.7	15.9	15.8	12.0
Total capital ratio	16.8	17.3	14.7	17.2	17.3	14.0

(a) The capital metrics reflect the CECL capital transition provisions. Additionally, loans originated under the PPP receive a zero percent risk weight.

(b) Represents minimum requirements and regulatory buffers applicable to the Firm. For the period ended December 31, 2020, the Basel III Standardized CET1, Tier 1, and Total capital ratio requirements applicable to the Firm were 11.3%, 12.8%, and 14.8%, respectively. Refer to Note 27 for additional information.

Three months ended (in millions, except ratios)	December 31, 2021 ^(b)	December 31, 2020 ^{(b)(c)}	Capital ratio requirements ^(d)
Leverage-based capital metrics:			
Adjusted average assets ^(a)	\$ 3,782,035	\$ 3,353,319	
Tier 1 leverage ratio	6.5 %	7.0 %	4.0 %
Total leverage exposure	\$ 4,571,789	\$ 3,401,542	
SLR	5.4 %	6.9 %	5.0 %

(a) Adjusted average assets, for purposes of calculating the leverage ratios, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets.

(b) The capital metrics reflect the CECL capital transition provisions.

(c) Total leverage exposure for purposes of calculating the SLR excludes U.S. Treasury securities and deposits at Federal Reserve Banks, as provided by the rule issued by the Federal Reserve which became effective April 1, 2020 and remained in effect through March 31, 2021. The SLR excluding the relief was 5.8% for the period ended December 31, 2020.

(d) Represents minimum requirements and regulatory buffers applicable to the Firm. Refer to Note 27 for additional information.

Management's discussion and analysis

Capital components

The following table presents reconciliations of total stockholders' equity to Basel III CET1 capital, Tier 1 capital and Total capital as of December 31, 2021 and 2020.

(in millions)	December 31, 2021	December 31, 2020
Total stockholders' equity	\$ 294,127	\$ 279,354
Less: Preferred stock	34,838	30,063
Common stockholders' equity	259,289	249,291
Add:		
Certain deferred tax liabilities ^(a)	2,499	2,453
Other CET1 capital adjustments ^(b)	3,351	3,486
Less:		
Goodwill	50,315	49,248
Other intangible assets	882	904
Standardized/Advanced CET1 capital	213,942	205,078
Preferred stock	34,838	30,063
Less: Other Tier 1 adjustments	2,618 ^(e)	297
Standardized/Advanced Tier 1 capital	\$ 246,162	\$ 234,844
Long-term debt and other instruments qualifying as Tier 2 capital	\$ 14,106	\$ 16,645
Qualifying allowance for credit losses ^(c)	15,012	18,372
Other	(380)	62
Standardized Tier 2 capital	\$ 28,738	\$ 35,079
Standardized Total capital	\$ 274,900	\$ 269,923
Adjustment in qualifying allowance for credit losses for Advanced Tier 2 capital ^(d)	(9,104)	(12,695)
Advanced Tier 2 capital	\$ 19,634	\$ 22,384
Advanced Total capital	\$ 265,796	\$ 257,228

- (a) Represents deferred tax liabilities related to tax-deductible goodwill and to identifiable intangibles created in nontaxable transactions, which are netted against goodwill and other intangibles when calculating CET1 capital.
- (b) As of December 31, 2021 and 2020, the impact of the CECL capital transition provision was an increase in CET1 capital of \$2.9 billion and \$5.7 billion, respectively.
- (c) Represents the allowance for credit losses eligible for inclusion in Tier 2 capital up to 1.25% of credit risk RWA, including the impact of the CECL capital transition provision with any excess deducted from RWA.
- (d) Represents an adjustment to qualifying allowance for credit losses for the excess of eligible credit reserves over expected credit losses up to 0.6% of credit risk RWA, including the impact of the CECL capital transition provision with any excess deducted from RWA.
- (e) Other Tier 1 Capital adjustments included \$2.0 billion of Series Z preferred stock called for redemption on December 31, 2021 and subsequently redeemed on February 1, 2022.

Capital rollforward

The following table presents the changes in Basel III CET1 capital, Tier 1 capital and Tier 2 capital for the year ended December 31, 2021.

Year Ended December 31, (in millions)	2021
Standardized/Advanced CET1 capital at December 31, 2020	\$ 205,078
Net income applicable to common equity	46,734
Dividends declared on common stock	(11,456)
Net purchase of treasury stock	(17,231)
Changes in additional paid-in capital	21
Changes related to AOCI	(8,070)
Adjustment related to AOCI ^(a)	2,972
Changes related to other CET1 capital adjustments ^(b)	(4,106)
Change in Standardized/Advanced CET1 capital	8,864
Standardized/Advanced CET1 capital at December 31, 2021	\$ 213,942
Standardized/Advanced Tier 1 capital at December 31, 2020	\$ 234,844
Change in CET1 capital ^(b)	8,864
Net issuance of noncumulative perpetual preferred stock	2,775 ^(c)
Other	(321)
Change in Standardized/Advanced Tier 1 capital	11,318
Standardized/Advanced Tier 1 capital at December 31, 2021	\$ 246,162
Standardized Tier 2 capital at December 31, 2020	\$ 35,079
Change in long-term debt and other instruments qualifying as Tier 2	(2,539)
Change in qualifying allowance for credit losses ^(b)	(3,360)
Other	(442)
Change in Standardized Tier 2 capital	(6,341)
Standardized Tier 2 capital at December 31, 2021	\$ 28,738
Standardized Total capital at December 31, 2021	\$ 274,900
Advanced Tier 2 capital at December 31, 2020	\$ 22,384
Change in long-term debt and other instruments qualifying as Tier 2	(2,539)
Change in qualifying allowance for credit losses ^(b)	231
Other	(442)
Change in Advanced Tier 2 capital	(2,750)
Advanced Tier 2 capital at December 31, 2021	\$ 19,634
Advanced Total capital at December 31, 2021	\$ 265,796

- (a) Includes cash flow hedges and debit valuation adjustment ("DVA") related to structured notes recorded in AOCI.
- (b) Includes the impact of the CECL capital transition provisions.
- (c) Net issuance of noncumulative perpetual preferred stock included \$2.0 billion of Series Z preferred stock called for redemption on December 31, 2021 and subsequently redeemed on February 1, 2022.

RWA rollforward

The following table presents changes in the components of RWA under Basel III Standardized and Advanced approaches for the year ended December 31, 2021. The amounts in the rollforward categories are estimates, based on the predominant driver of the change.

Year ended December 31, 2021 (in millions)	Standardized			Advanced			
	Credit risk RWA ^(d)	Market risk RWA	Total RWA	Credit risk RWA ^(d)	Market risk RWA	Operational risk RWA	Total RWA
December 31, 2020	\$ 1,464,219	\$ 96,390	\$ 1,560,609	\$ 1,002,330	\$ 96,910	\$ 385,191	\$ 1,484,431
Model & data changes ^(a)	(2,586)	(8,309)	(10,895)	(7,675)	(8,309)	–	(15,984)
Portfolio runoff ^(b)	(5,300)	–	(5,300)	(3,640)	–	–	(3,640)
Movement in portfolio levels ^(c)	87,119	7,367	94,486	56,027	6,905	20,181	83,113
Changes in RWA	79,233	(942)	78,291	44,712	(1,404)	20,181	63,489
December 31, 2021	\$ 1,543,452	\$ 95,448	\$ 1,638,900	\$ 1,047,042	\$ 95,506	\$ 405,372	\$ 1,547,920

- (a) Model & data changes refer to material movements in levels of RWA as a result of revised methodologies and/or treatment per regulatory guidance (exclusive of rule changes).
- (b) Portfolio runoff for Credit risk RWA primarily reflects reduced risk from position rollofs in legacy portfolios in Home Lending.
- (c) Movement in portfolio levels (inclusive of rule changes) refers to: for Credit risk RWA, changes in book size, composition and credit quality, market movements, and deductions for excess eligible credit reserves not eligible for inclusion in Tier 2 capital; for Market risk RWA, changes in position, market movements, and changes in the Firm's regulatory multiplier from Regulatory VaR backtesting exceptions; and for Operational risk RWA, updates to cumulative losses and macroeconomic model inputs.
- (d) As of December 31, 2021 and 2020, the Basel III Standardized Credit risk RWA included wholesale and retail off balance-sheet RWA of \$218.5 billion and \$204.3 billion, respectively; and the Basel III Advanced Credit risk RWA included wholesale and retail off balance-sheet RWA of \$188.5 billion and \$158.9 billion, respectively.

Refer to the Firm's Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website, for further information on Credit risk RWA, Market risk RWA and Operational risk RWA.

Supplementary leverage ratio

The following table presents the components of the Firm's SLR.

Three months ended (in millions, except ratio)	December 31, 2021	December 31, 2020
Tier 1 capital	\$ 246,162	\$ 234,844
Total average assets	3,831,655	3,399,818
Less: Regulatory capital adjustments ^(a)	49,620	46,499
Total adjusted average assets ^(b)	3,782,035	3,353,319
Add: Off-balance sheet exposures ^(c)	789,754	729,978
Less: Exclusion for U.S. Treasuries and Federal Reserve Bank deposits	–	681,755
Total leverage exposure	\$ 4,571,789	\$ 3,401,542
SLR	5.4 %	6.9 %^(d)

- (a) For purposes of calculating the SLR, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill, other intangible assets and adjustments for the CECL capital transition provisions.
- (b) Adjusted average assets used for the calculation of Tier 1 leverage ratio.
- (c) Off-balance sheet exposures are calculated as the average of the three month-end spot balances on applicable regulatory exposures during the reporting quarter. Refer to the Firm's Pillar 3 Regulatory Capital Disclosures reports for additional information.
- (d) The SLR excluding the relief was 5.8% for the period ended December 31, 2020.

Refer to Note 27 for JPMorgan Chase Bank, N.A.'s SLR.

Line of business equity

Each business segment is allocated capital by taking into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. ROE is measured and internal targets for expected returns are established as key measures of a business segment's performance.

The Firm's allocation methodology incorporates Basel III Standardized RWA, Basel III Advanced RWA, the GSIB surcharge, and a simulation of capital in a severe stress environment. As of January 1, 2022, the Firm has changed its line of business capital allocations primarily as a result of changes in RWA for each LOB and to reflect an increase in the Firm's GSIB surcharge to 4.0% that will be effective January 1, 2023. The assumptions and methodologies used to allocate capital are periodically reassessed and as a result, the capital allocated to the LOBs may change from time to time.

The following table presents the capital allocated to each business segment.

Line of business equity (Allocated capital)

(in billions)	January 1, 2022	December 31,	
		2021	2020
Consumer & Community Banking	\$ 50.0	\$ 50.0	\$ 52.0
Corporate & Investment Bank	103.0	83.0	80.0
Commercial Banking	25.0	24.0	22.0
Asset & Wealth Management	17.0	14.0	10.5
Corporate	64.3	88.3	84.8
Total common stockholders' equity	\$ 259.3	\$ 259.3	\$ 249.3

Management's discussion and analysis

Capital actions

Common stock dividends

The Firm's common stock dividends are planned as part of the Capital Management governance framework in line with the Firm's capital management objectives.

The Firm's quarterly common stock dividend is currently \$1.00 per share. The Firm's dividends are subject to approval by the Board of Directors on a quarterly basis. Refer to Note 21 and Note 26 for information regarding dividend restrictions.

The following table shows the common dividend payout ratio based on net income applicable to common equity.

Year ended December 31,	2021	2020	2019
Common dividend payout ratio	25 %	40 %	31 %

Common stock

On December 18, 2020, the Federal Reserve announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021. Subsequently, the Firm announced that its Board of Directors authorized a new common share repurchase program for up to \$30 billion. As directed by the Federal Reserve, total net repurchases and common stock dividends in the first and second quarters of 2021 were restricted and could not exceed the average of the Firm's net income for the four preceding calendar quarters.

On June 24, 2021, the Federal Reserve announced that the temporary restrictions on capital distributions would expire on June 30, 2021 as a result of the Firm remaining above its minimum risk-based capital requirements under the 2021 CCAR stress test. Effective July 1, 2021, the Firm became subject to the normal capital distribution restrictions provided under the regulatory capital framework. The Firm continues to be authorized to repurchase common shares under its existing common share repurchase program previously approved by the Board of Directors.

Refer to capital planning and stress testing on pages 86-87 for additional information.

The following table sets forth the Firm's repurchases of common stock for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions)	2021	2020 ^(a)	2019
Total number of shares of common stock repurchased	119.7	50.0	213.0
Aggregate purchase price of common stock repurchases	\$ 18,448	\$ 6,397	\$ 24,121

(a) On March 15, 2020, in response to the economic disruptions caused by the COVID-19 pandemic, the Firm temporarily suspended repurchases of its common stock. Subsequently, the Federal Reserve directed all large banks, including the Firm, to discontinue net share repurchases through the end of 2020.

The Board of Director's authorization to repurchase common shares is utilized at management's discretion, and the timing of purchases and the exact amount of common shares that may be repurchased is subject to various factors, including market conditions; legal and regulatory considerations affecting the amount and timing of repurchase activity; the Firm's capital position (taking into account goodwill and intangibles); internal capital generation; and alternative investment opportunities. The repurchase program does not include specific price targets or timetables; may be suspended by management at any time; and may be executed through open market purchases or privately negotiated transactions, or utilizing Rule 10b5-1 plans, which are written trading plans that the Firm may enter into from time to time under Rule 10b5-1 of the Securities Exchange Act of 1934 and which allow the Firm to repurchase its common shares during periods when it may otherwise not be repurchasing common shares – for example, during internal trading blackout periods. Refer to Part II, Item 5: Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities on page 35 of the 2021 Form 10-K for additional information regarding repurchases of the Firm's equity securities.

Preferred stock

Preferred stock dividends declared were \$1.6 billion for the year ended December 31, 2021.

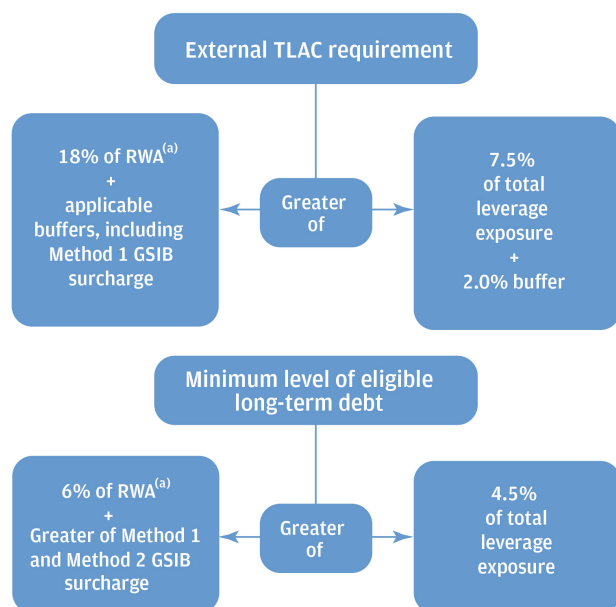
During the year ended December 31, 2021, the Firm issued and redeemed several series of non-cumulative preferred stock. Additionally, on December 31, 2021, the Firm announced the redemption of \$2.0 billion of its fixed-to-floating rate non-cumulative preferred stock, Series Z and subsequently redeemed those securities on February 1, 2022. Refer to Note 21 for additional information on the Firm's preferred stock, including the issuance and redemption of preferred stock.

Other capital requirements

Total Loss-Absorbing Capacity

The Federal Reserve's TLAC rule requires the U.S. GSIB top-tier holding companies, including the Firm, to maintain minimum levels of external TLAC and eligible long-term debt.

The external TLAC requirements and the minimum level of eligible long-term debt requirements are shown below:



(a) RWA is the greater of Standardized and Advanced compared to their respective regulatory capital ratio requirements.

Failure to maintain TLAC equal to or in excess of the regulatory minimum plus applicable buffers will result in limitations on the amount of capital that the Firm may distribute, such as through dividends and common share repurchases, as well as on certain executive discretionary bonus payments.

The following table presents the eligible external TLAC and eligible LTD amounts, as well as a representation of the amounts as a percentage of the Firm's total RWA and total leverage exposure applying the impact of the CECL capital transition provisions as of December 31, 2021 and 2020.

(in billions, except ratio)	December 31, 2021		December 31, 2020 ^(a)	
	External TLAC	LTD	External TLAC	LTD
Total eligible amount	\$ 464.6	\$ 210.4	\$ 421.0	\$ 181.4
% of RWA	28.4 %	12.8 %	27.0 %	11.6 %
Regulatory requirements	22.5	9.5	23.0	9.5
Surplus/ (shortfall)	\$ 95.9	\$ 54.7	\$ 62.1	\$ 33.1
% of total leverage exposure	10.2 %	4.6 %	12.4 %	5.3 %
Regulatory requirements	9.5	4.5	9.5	4.5
Surplus/ (shortfall)	\$ 30.3	\$ 4.6	\$ 97.9	\$ 28.3

(a) Total leverage exposure excludes U.S. Treasury securities and deposits at Federal Reserve Banks, as provided by the rule issued by the Federal Reserve which became effective April 1, 2020 and remained in effect through March 31, 2021.

Refer to Risk-based Capital Regulatory Requirements on pages 89-90 for further information on the GSIB surcharge.

Refer to Liquidity Risk Management on pages 97-104 for further information on long-term debt issued by the Parent Company.

Refer to Part I, Item 1A: Risk Factors on pages 9-33 of the 2021 Form 10-K for information on the financial consequences to holders of the Firm's debt and equity securities in a resolution scenario.

Management's discussion and analysis

Broker-dealer regulatory capital

J.P. Morgan Securities

JPMorgan Chase's principal U.S. broker-dealer subsidiary is J.P. Morgan Securities. J.P. Morgan Securities is subject to Rule 15c3-1 under the Securities Exchange Act of 1934 (the "Net Capital Rule"). J.P. Morgan Securities is also registered as a futures commission merchant and is subject to regulatory capital requirements, including those imposed by the SEC, Commodity Futures Trading Commission ("CFTC"), Financial Industry Regulatory Authority ("FINRA") and the National Futures Association ("NFA").

J.P. Morgan Securities has elected to compute its minimum net capital requirements in accordance with the "Alternative Net Capital Requirements" of the Net Capital Rule.

The following table presents J.P. Morgan Securities' net capital:

December 31, 2021		
(in millions)	Actual	Minimum
Net Capital	\$ 24,581	\$ 5,968

J.P. Morgan Securities registered with the SEC as a security-based swap dealer effective November 1, 2021 and continues to be registered with the CFTC as a swap dealer. As a result of additional SEC and CFTC capital and financial reporting requirements for security-based swap dealers and swap dealers, J.P. Morgan Securities is subject to alternative minimum net capital requirements and required to hold "tentative net capital" in excess of \$5.0 billion (up from \$1.0 billion). J.P. Morgan Securities is also required to notify the SEC and CFTC in the event that its tentative net capital is less than \$6.0 billion (up from \$5.0 billion). Tentative net capital is net capital before deducting market and credit risk charges as defined by the Net Capital Rule. As of December 31, 2021, J.P. Morgan Securities maintained tentative net capital in excess of the minimum and notification requirements.

J.P. Morgan Securities plc

J.P. Morgan Securities plc is a wholly-owned subsidiary of JPMorgan Chase Bank, N.A. and has authority to engage in banking, investment banking and broker-dealer activities. J.P. Morgan Securities plc is jointly regulated by the U.K. Prudential Regulation Authority ("PRA") and the Financial Conduct Authority ("FCA"). J.P. Morgan Securities plc is subject to the European Union Capital Requirements Regulation, as adopted in the U.K., and the PRA capital rules, each of which have implemented Basel III and thereby subject J.P. Morgan Securities plc to its requirements.

The Bank of England requires that U.K. banks, including U.K. regulated subsidiaries of overseas groups, maintain a minimum requirement for own funds and eligible liabilities ("MREL"). The MREL requirements were subject to a phased implementation and became fully-phased in on January 1, 2022. As of December 31, 2021, J.P. Morgan Securities plc was compliant with the fully-phased in requirements of the MREL rule.

The following table presents J.P. Morgan Securities plc's capital metrics:

December 31, 2021		
(in millions, except ratios)	Estimated	Regulatory Minimum ratios ^(a)
Total capital	\$ 54,818	
CET1 ratio	18.5 %	4.5 %
Total capital ratio	23.7 %	8.0 %

(a) Represents minimum requirements excluding additional capital requirements (i.e. capital buffers) specified by the PRA. J.P. Morgan Securities plc's capital ratios as of December 31, 2021 exceeded the minimum requirements, including the additional capital requirements specified by the PRA.

LIQUIDITY RISK MANAGEMENT

Liquidity risk is the risk that the Firm will be unable to meet its contractual and contingent financial obligations as they arise or that it does not have the appropriate amount, composition and tenor of funding and liquidity to support its assets and liabilities.

Liquidity risk oversight

The Firm has a Liquidity Risk Oversight function whose primary objective is to provide oversight of liquidity risk across the Firm. Liquidity Risk Oversight's responsibilities include:

- Defining, monitoring and reporting liquidity risk metrics;
- Independently establishing and monitoring limits and indicators, including liquidity risk appetite;
- Developing a process to classify, monitor and report limit breaches;
- Performing an independent review of liquidity risk management processes;
- Monitoring and reporting internal Firmwide and legal entity liquidity stress tests, regulatory defined metrics, as well as liquidity positions, balance sheet variances and funding activities; and
- Approving or escalating for review new or updated liquidity stress assumptions.

Liquidity management

Treasury & CIO is responsible for liquidity management.

The primary objectives of the Firm's liquidity management are to:

- Ensure that the Firm's core businesses and material legal entities are able to operate in support of client needs and meet contractual and contingent financial obligations through normal economic cycles as well as during stress events, and
- Manage an optimal funding mix and availability of liquidity sources.

The Firm addresses these objectives through:

- Analyzing and understanding the liquidity characteristics of the assets and liabilities of the Firm, LOBs and legal entities, taking into account legal, regulatory, and operational restrictions;
- Developing internal liquidity stress testing assumptions;
- Defining and monitoring Firmwide and legal entity-specific liquidity strategies, policies, reporting and contingency funding plans;
- Managing liquidity within the Firm's approved liquidity risk appetite tolerances and limits;
- Managing compliance with regulatory requirements related to funding and liquidity risk; and
- Setting FTP in accordance with underlying liquidity characteristics of balance sheet assets and liabilities as well as certain off-balance sheet items.

As part of the Firm's overall liquidity management strategy, the Firm manages liquidity and funding using a centralized, global approach designed to:

- Optimize liquidity sources and uses;
- Monitor exposures;
- Identify constraints on the transfer of liquidity between the Firm's legal entities; and
- Maintain the appropriate amount of surplus liquidity at a Firmwide and legal entity level, where relevant.

Governance

Committees responsible for liquidity governance include the Firmwide ALCO as well as LOB and regional ALCOs, the Treasurer Committee, and the CTC Risk Committee. In addition, the Board Risk Committee reviews and recommends to the Board of Directors, for formal approval, the Firm's liquidity risk tolerances, liquidity strategy, and liquidity policy. Refer to Firmwide Risk Management on pages 81-84 for further discussion of ALCO and other risk-related committees.

Internal stress testing

Liquidity stress tests are intended to ensure that the Firm has sufficient liquidity under a variety of adverse scenarios, including scenarios analyzed as part of the Firm's resolution and recovery planning. Stress scenarios are produced for JPMorgan Chase & Co. ("Parent Company") and the Firm's material legal entities on a regular basis, and other stress tests are performed in response to specific market events or concerns. Liquidity stress tests assume all of the Firm's contractual financial obligations are met and take into consideration:

- Varying levels of access to unsecured and secured funding markets;
- Estimated non-contractual and contingent cash outflows; and
- Potential impediments to the availability and transferability of liquidity between jurisdictions and material legal entities such as regulatory, legal or other restrictions.

Liquidity outflow assumptions are modeled across a range of time horizons and currency dimensions and contemplate both market and idiosyncratic stresses.

Results of stress tests are considered in the formulation of the Firm's funding plan and assessment of its liquidity position. The Parent Company acts as a source of funding for the Firm through equity and long-term debt issuances, and its intermediate holding company, JPMorgan Chase Holdings LLC (the "IHC") provides funding support to the ongoing operations of the Parent Company and its subsidiaries. The Firm maintains liquidity at the Parent Company, IHC, and operating subsidiaries at levels sufficient to comply with liquidity risk tolerances and minimum liquidity requirements, and to manage through periods of

Management's discussion and analysis

stress when access to normal funding sources may be disrupted.

Contingency funding plan

The Firm's Contingency Funding Plan ("CFP") sets out the strategies for addressing and managing liquidity resource needs during a liquidity stress event and incorporates liquidity risk limits, indicators and risk appetite tolerances. The CFP also identifies the alternative contingent funding and liquidity resources available to the Firm and its legal entities in a period of stress.

Liquidity Coverage Ratio and HQLA

The LCR rule requires that the Firm and JPMorgan Chase Bank, N.A. maintain an amount of eligible HQLA that is sufficient to meet its estimated total net cash outflows over a prospective 30 calendar-day period of significant stress. Eligible HQLA, for purposes of calculating the LCR, is the amount of unencumbered HQLA that satisfy certain operational considerations as defined in the LCR rule. HQLA primarily consist of cash and certain high-quality liquid securities as defined in the LCR rule.

Under the LCR rule, the amount of eligible HQLA held by JPMorgan Chase Bank, N.A. that is in excess of its stand-alone 100% minimum LCR requirement, and that is not transferable to non-bank affiliates, must be excluded from the Firm's reported eligible HQLA.

Estimated net cash outflows are based on standardized stress outflow and inflow rates prescribed in the LCR rule, which are applied to the balances of the Firm's assets, sources of funds, and obligations. The LCR for both the Firm and JPMorgan Chase Bank, N.A. is required to be a minimum of 100%.

The following table summarizes the Firm and JPMorgan Chase Bank, N.A.'s average LCR for the three months ended December 31, 2021, September 30, 2021 and December 31, 2020 based on the Firm's interpretation of the LCR framework.

Average amount (in millions)	Three months ended		
	December 31, 2021	September 30, 2021	December 31, 2020
JPMorgan Chase & Co.:			
HQLA			
Eligible cash ^(a)	\$ 703,384	\$ 690,013	\$ 455,612
Eligible securities ^{(b)(c)}	34,738	34,049	241,447
Total HQLA^(d)	\$ 738,122	\$ 724,062	\$ 697,059
Net cash outflows	\$ 664,801	\$ 645,557	\$ 634,037
LCR	111 %	112 %	110 %
Net excess eligible HQLA^(d)	\$ 73,321	\$ 78,505	\$ 63,022
JPMorgan Chase Bank, N.A.:			
LCR	178 %	174 %	160 %
Net excess eligible HQLA	\$ 555,300	\$ 516,374	\$ 401,903

(a) Represents cash on deposit at central banks, primarily the Federal Reserve Banks.

(b) Predominantly U.S. Treasuries, U.S. GSE and government agency MBS, and sovereign bonds net of applicable haircuts under the LCR rule.

(c) Eligible HQLA securities may be reported in securities borrowed or purchased under resale agreements, trading assets, or investment securities on the Firm's Consolidated balance sheets.

(d) Excludes average excess eligible HQLA at JPMorgan Chase Bank, N.A. that are not transferable to non-bank affiliates.

The Firm's average LCR increased during the three months ended December 31, 2021, compared with the prior year period primarily due to long-term debt issuances.

JPMorgan Chase Bank, N.A.'s average LCR increased during the three months ended December 31, 2021, compared with both the three month periods ended September 30, 2021 and December 31, 2020 primarily due to growth in deposits. The increase in excess liquidity in JPMorgan Chase Bank, N.A. is excluded from the Firm's reported LCR under the LCR rule.

The Firm and JPMorgan Chase Bank, N.A.'s average LCR fluctuates from period to period, due to changes in its eligible HQLA and estimated net cash outflows as a result of ongoing business activity. Refer to the Firm's U.S. LCR Disclosure reports, which are available on the Firm's website, for a further discussion of the Firm's LCR.

Other liquidity sources

In addition to the assets reported in the Firm's eligible HQLA discussed above, the Firm had unencumbered marketable securities, such as equity and debt securities, that the Firm believes would be available to raise liquidity. This includes excess eligible HQLA securities at JPMorgan Chase Bank, N.A. that are not transferable to non-bank affiliates. The fair value of these securities was approximately \$914 billion and \$740 billion as of December 31, 2021 and 2020, respectively, although the amount of liquidity that could be raised at any particular time would be dependent on prevailing market conditions. The fair value increased compared to December 31, 2020, due to an increase in excess eligible HQLA at JPMorgan Chase Bank, N.A. which was primarily a result of increased deposits.

The Firm also had available borrowing capacity at FHLBs and the discount window at the Federal Reserve Bank as a result of collateral pledged by the Firm to such banks of approximately \$308 billion and \$307 billion as of December 31, 2021 and 2020, respectively. This borrowing capacity excludes the benefit of cash and securities reported in the Firm's eligible HQLA or other unencumbered securities that are currently pledged at the Federal Reserve Bank discount window and other central banks. Although available, the Firm does not view this borrowing capacity at the Federal Reserve Bank discount window and the other central banks as a primary source of liquidity.

NSFR

The net stable funding ratio ("NSFR") is a liquidity requirement for large banking organizations that is intended to measure the adequacy of "available" and "required" amounts of stable funding over a one-year horizon. On October 20, 2020, the federal banking agencies issued a final NSFR rule under which large banking organizations such as the Firm and JPMorgan Chase Bank, N.A. are required to maintain an NSFR of at least 100% on an ongoing basis. The final NSFR rule became effective on July 1, 2021, and the Firm will be required to publicly disclose its quarterly average NSFR semi-annually beginning in 2023.

As of December 31, 2021, the Firm and JPMorgan Chase Bank, N.A. were compliant with the 100% minimum NSFR, based on the Firm's current understanding of the final rule.

Management's discussion and analysis

Funding

Sources of funds

Management believes that the Firm's unsecured and secured funding capacity is sufficient to meet its on- and off-balance sheet obligations, which includes both short- and long-term cash requirements.

The Firm funds its global balance sheet through diverse sources of funding including stable deposits, secured and unsecured funding in the capital markets and stockholders' equity. Deposits are the primary funding source for JPMorgan Chase Bank, N.A. Additionally, JPMorgan Chase Bank, N.A. may access funding through short- or long-term secured borrowings, through the issuance of unsecured

long-term debt, or from borrowings from the IHC. The Firm's non-bank subsidiaries are primarily funded from long-term unsecured borrowings and short-term secured borrowings, primarily securities loaned or sold under repurchase agreements. Excess funding is invested by Treasury and CIO in the Firm's investment securities portfolio or deployed in cash or other short-term liquid investments based on their interest rate and liquidity risk characteristics.

Refer to Note 28 for additional information on off-balance sheet obligations.

Deposits

The table below summarizes, by LOB and Corporate, the period-end and average deposit balances as of and for the years ended December 31, 2021 and 2020.

As of or for the year ended December 31, (in millions)	2021		2020	
	2021	2020	Average 2021	Average 2020
Consumer & Community Banking	\$ 1,148,110	\$ 958,706	\$ 1,054,956	\$ 851,390
Corporate & Investment Bank	707,791	702,215	760,048	655,095
Commercial Banking	323,954	284,263	301,343	237,645
Asset & Wealth Management	282,052	198,755	230,296	161,955
Corporate	396	318	511	666
Total Firm	\$ 2,462,303	\$ 2,144,257	\$ 2,347,154	\$ 1,906,751

Deposits provide a stable source of funding and reduce the Firm's reliance on the wholesale funding markets. A significant portion of the Firm's deposits are consumer deposits and wholesale operating deposits, which are both considered to be stable sources of liquidity. Wholesale operating deposits are considered to be stable sources of liquidity because they are generated from customers that maintain operating service relationships with the Firm. Furthermore, certain deposits are covered by insurance protection that provides additional funding stability and results in a benefit to the LCR. Deposit insurance protection may be available to depositors in the countries in which the deposits are placed. For example, the Federal Deposit Insurance Corporation ("FDIC") provides deposit insurance protection for deposits placed in a U.S. Depository Institution. At December 31, 2021 and 2020, the Firmwide estimated uninsured deposits were \$1,489.6 billion and \$1,275.9 billion, respectively, primarily reflecting wholesale operating deposits.

Total uninsured deposits include time deposits. The table below presents an estimate of uninsured U.S. and non-U.S. time deposits, and their remaining maturities. The Firm's estimates of its uninsured U.S. time deposits are based on data that the Firm calculates periodically under applicable FDIC regulations. For purposes of this presentation, all non-U.S. time deposits are deemed to be uninsured.

(in millions)	December 31, 2021		December 31, 2020	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Three months or less	\$ 29,359	\$ 49,342	\$ 23,468	\$ 45,648
Over three months but within 6 months	6,235	2,172	4,115	1,887
Over six months but within 12 months	913	459	3,158	675
Over 12 months	526	2,562	738	2,566
Total	\$ 37,033	\$ 54,535	\$ 31,479	\$ 50,776

The table below shows the loan and deposit balances, the loans-to-deposits ratios, and deposits as a percentage of total liabilities, as of December 31, 2021 and 2020.

As of December 31, (in billions except ratios)	2021	2020
Deposits	\$ 2,462.3	\$ 2,144.3
Deposits as a % of total liabilities	71 %	69 %
Loans	1,077.7	1,012.9
Loans-to-deposits ratio	44 %	47 %

The Firm believes that average deposit balances are generally more representative of deposit trends than period-end deposit balances, over time. However, during periods of market disruption those trends could be affected.

Average deposits increased for the year ended December 31, 2021, reflecting significant inflows across the LOBs primarily driven by the effect of certain government actions in response to the COVID-19 pandemic.

The following table provides a summary of the average balances and average interest rates of JPMorgan Chase's deposits for the years ended December 31, 2021, 2020, and 2019.

(Unaudited) Year ended December 31, (in millions, except interest rates)	Average balances			Average interest rates		
	2021	2020	2019	2021	2020	2019
U.S. offices						
Noninterest-bearing	\$ 625,974	\$ 495,722	\$ 386,116	NA	NA	NA
Interest-bearing						
Demand ^(a)	324,917	269,888	195,350	0.06 %	0.25 %	1.42 %
Savings ^(b)	950,267	739,916	602,728	0.06	0.13	0.46
Time	48,628	59,053	52,415	0.26	1.10	2.56
Total interest-bearing deposits	1,323,812	1,068,857	850,493	0.07	0.21	0.81
Total deposits in U.S. offices	1,949,786	1,564,579	1,236,609	0.05	0.15	0.56
Non-U.S. offices						
Noninterest-bearing	26,315	21,805	21,103	NA	NA	NA
Interest-bearing						
Demand	313,304	267,545	217,979	(0.10)	–	0.59
Savings	–	–	–	–	–	–
Time	57,749	52,822	47,376	(0.09)	0.13	1.64
Total interest-bearing deposits	371,053	320,367	265,355	(0.10)	0.02	0.78
Total deposits in non-U.S. offices	397,368	342,172	286,458	(0.09)	0.02	0.72
Total deposits	\$ 2,347,154	\$ 1,906,751	\$ 1,523,067	0.02 %	0.12 %	0.59 %

(a) Includes Negotiable Order of Withdrawal (“NOW”) accounts, and certain trust accounts.

(b) Includes Money Market Deposit Accounts (“MMDAs”).

Refer to Note 17 for additional information on deposits.

In CCB, the increase was also driven by growth from existing and new accounts across both consumer and small business customers.

Refer to the discussion of the Firm's Business Segment Results and the Consolidated Balance Sheets Analysis on pages 61-80 and pages 55-56, respectively, for further information on deposit and liability balance trends.

Management's discussion and analysis

The following table summarizes short-term and long-term funding, excluding deposits, as of December 31, 2021 and 2020, and average balances for the years ended December 31, 2021 and 2020. Refer to the Consolidated Balance Sheets Analysis on pages 55-56 and Note 11 for additional information.

Sources of funds (excluding deposits)

As of or for the year ended December 31, (in millions)	2021	2020	Average	
			2021	2020
Commercial paper	\$ 15,108	\$ 12,031	\$ 12,285	\$ 12,129
Other borrowed funds	9,999	8,510	12,903	9,198
Federal funds purchased	1,769	2,446	\$ 2,197	2,531
Total short-term unsecured funding	\$ 26,876	\$ 22,987	\$ 27,385	\$ 23,858
Securities sold under agreements to repurchase ^(a)	\$ 189,806	\$ 207,877	\$ 250,229	\$ 246,354
Securities loaned ^(a)	2,765	4,886	6,876	6,536
Other borrowed funds	28,487	24,667 ^(f)	28,138 ^(f)	23,812 ^(f)
Obligations of Firm-administered multi-seller conduits ^(b)	6,198	10,523	9,283	11,430
Total short-term secured funding	\$ 227,256	\$ 247,953	\$ 294,526	\$ 288,132
Senior notes	\$ 191,488	\$ 166,089	\$ 181,290	\$ 171,509
Subordinated debt	20,531	21,608	20,877	20,789
Structured notes ^(c)	73,956	75,325	75,152	73,056
Total long-term unsecured funding	\$ 285,975	\$ 263,022	\$ 277,319	\$ 265,354
Credit card securitization ^(b)	\$ 2,397	\$ 4,943	\$ 3,156	\$ 5,520
FHLB advances	11,110	14,123	12,174	27,076
Other long-term secured funding ^(d)	3,920	4,540	4,384	4,460
Total long-term secured funding	\$ 17,427	\$ 23,606	\$ 19,714	\$ 37,056
Preferred stock^(e)	\$ 34,838	\$ 30,063	\$ 33,027	\$ 29,899
Common stockholders' equity^(e)	\$ 259,289	\$ 249,291	\$ 250,968	\$ 236,865

(a) Primarily consists of short-term securities loaned or sold under agreements to repurchase.

(b) Included in beneficial interests issued by consolidated variable interest entities on the Firm's Consolidated balance sheets.

(c) Includes certain TLAC-eligible long-term unsecured debt issued by the Parent Company.

(d) Includes long-term structured notes which are secured.

(e) Refer to Capital Risk Management on pages 86-96, Consolidated statements of changes in stockholders' equity on page 163, Note 21 and Note 22 for additional information on preferred stock and common stockholders' equity.

(f) Includes nonrecourse advances provided under the Money Market Mutual Fund Liquidity Facility.

Short-term funding

The Firm's sources of short-term secured funding primarily consist of securities loaned or sold under agreements to repurchase. These instruments are secured predominantly by high-quality securities collateral, including government-issued debt and U.S. GSE and government agency MBS. Securities sold under agreements to repurchase decreased at December 31, 2021, compared with December 31, 2020, due to lower secured financing of AFS investment securities in Treasury and CIO, and trading assets in CIB Markets.

The balances associated with securities loaned or sold under agreements to repurchase fluctuate over time due to investment and financing activities of clients, the Firm's demand for financing, the ongoing management of the mix of the Firm's liabilities, including its secured and unsecured financing (for both the investment securities and market-making portfolios), and other market and portfolio factors.

The Firm's sources of short-term unsecured funding primarily consist of issuances of wholesale commercial paper and other borrowed funds. The increase in commercial paper at December 31, 2021, from December 31, 2020 was due to higher net issuance primarily for short-term liquidity management.

The increase in unsecured other borrowed funds at December 31, 2021 from December 31, 2020, and for the average year ended December 31, 2021 compared to the prior year period, was primarily due to net issuances of structured notes.

Long-term funding and issuance

Long-term funding provides an additional source of stable funding and liquidity for the Firm. The Firm's long-term funding plan is driven primarily by expected client activity, liquidity considerations, and regulatory requirements, including TLAC. Long-term funding objectives include maintaining diversification, maximizing market access and optimizing funding costs. The Firm evaluates various funding markets, tenors and currencies in creating its optimal long-term funding plan.

The significant majority of the Firm's long-term unsecured funding is issued by the Parent Company to provide flexibility in support of both bank and non-bank subsidiary funding needs. The Parent Company advances substantially all net funding proceeds to its subsidiary, the IHC. The IHC does not issue debt to external counterparties. The following table summarizes long-term unsecured issuance and maturities or redemptions for the years ended December 31, 2021 and 2020. Refer to Note 20 for additional information on the IHC and long-term debt.

Long-term unsecured funding

Year ended December 31, (Notional in millions)	2021		2020	
	Parent Company		Subsidiaries	
Issuance				
Senior notes issued in the U.S. market	\$ 39,500	\$ 25,500	\$ —	\$ 60
Senior notes issued in non-U.S. markets	5,581	1,355	—	—
Total senior notes	45,081	26,855	—	60
Subordinated debt	—	3,000	—	—
Structured notes ^(a)	4,113	7,596	32,714	24,185
Total long-term unsecured funding - issuance	\$ 49,194	\$ 37,451	\$ 32,714	\$ 24,245
Maturities/redemptions				
Senior notes	\$ 10,840	\$ 28,719	\$ 65	\$ 7,701
Subordinated debt	9	135	—	—
Structured notes	4,694	5,340	33,023	30,002
Total long-term unsecured funding - maturities/redemptions	\$ 15,543	\$ 34,194	\$ 33,088	\$ 37,703

(a) Includes certain TLAC-eligible long-term unsecured debt issued by the Parent Company.

The Firm can also raise secured long-term funding through securitization of consumer credit card loans and FHLB advances. The following table summarizes the securitization issuance and FHLB advances and their respective maturities or redemptions for the years ended December 31, 2021 and 2020.

Long-term secured funding

Year ended December 31, (in millions)	Issuance		Maturities/Redemptions	
	2021	2020	2021	2020
Credit card securitization	\$ —	\$ 1,000	\$ 2,550	\$ 2,525
FHLB advances	—	15,000	3,011	29,509
Other long-term secured funding ^(a)	525	1,130	741	1,048
Total long-term secured funding	\$ 525	\$ 17,130	\$ 6,302	\$ 33,082

(a) Includes long-term structured notes which are secured.

The Firm's wholesale businesses also securitize loans for client-driven transactions; those client-driven loan securitizations are not considered to be a source of funding for the Firm and are not included in the table above. Refer to Note 14 for a further description of client-driven loan securitizations.

Management’s discussion and analysis

Credit ratings

The cost and availability of financing are influenced by credit ratings. Reductions in these ratings could have an adverse effect on the Firm’s access to liquidity sources, increase the cost of funds, trigger additional collateral or funding requirements and decrease the number of investors and counterparties willing to lend to the Firm. The nature and magnitude of the impact of ratings downgrades depends on numerous contractual and behavioral factors, which the Firm believes are incorporated in its liquidity risk and stress testing metrics. The Firm believes that it

maintains sufficient liquidity to withstand a potential decrease in funding capacity due to ratings downgrades.

Additionally, the Firm’s funding requirements for VIEs and other third-party commitments may be adversely affected by a decline in credit ratings. Refer to liquidity risk and credit-related contingent features in Note 5 for additional information on the impact of a credit ratings downgrade on the funding requirements for VIEs, and on derivatives and collateral agreements.

The credit ratings of the Parent Company and the Firm’s principal bank and non-bank subsidiaries as of December 31, 2021 were as follows:

December 31, 2021	JPMorgan Chase & Co.			JPMorgan Chase Bank, N.A.			J.P. Morgan Securities LLC J.P. Morgan Securities plc		
	Long-term issuer	Short-term issuer	Outlook	Long-term issuer	Short-term issuer	Outlook	Long-term issuer	Short-term issuer	Outlook
Moody’s Investors Service ^(a)	A2	P-1	Positive/ Stable	Aa2	P-1	Stable	Aa3	P-1	Stable
Standard & Poor’s ^(b)	A-	A-2	Positive	A+	A-1	Positive	A+	A-1	Positive
Fitch Ratings ^(c)	AA-	F1+	Stable	AA	F1+	Stable	AA	F1+	Stable

(a) On July 12, 2021, Moody’s revised the outlook of the Parent Company’s long-term issuer rating from stable to positive. The outlook for the Parent Company’s short-term issuer rating and the Firm’s principal bank and non-bank subsidiaries remained unchanged at stable.

(b) On May 24, 2021, Standard & Poor’s affirmed the credit ratings of the Parent Company and the Firm’s principal bank and non-bank subsidiaries, and revised the outlook from stable to positive.

(c) On April 23, 2021, Fitch affirmed the credit ratings of the Parent Company and the Firm’s principal bank and non-bank subsidiaries, and revised the outlook from negative to stable.

JPMorgan Chase’s unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Firm’s credit ratings, financial ratios, earnings, or stock price.

Critical factors in maintaining high credit ratings include a stable and diverse earnings stream, strong capital and liquidity ratios, strong credit quality and risk management controls, and diverse funding sources. Rating agencies continue to evaluate economic and geopolitical trends, regulatory developments, future profitability, risk management practices, and litigation matters, as well as their broader ratings methodologies. Changes in any of these factors could lead to changes in the Firm’s credit ratings.

REPUTATION RISK MANAGEMENT

Reputation risk is the risk that an action or inaction may negatively impact perception of the Firm's integrity and reduce confidence in the Firm's competence by various constituents, including clients, counterparties, customers, investors, regulators, employees, communities or the broader public.

Organization and management

Reputation Risk Management establishes the governance framework for managing reputation risk across the Firm's LOBs and Corporate. As reputation risk is inherently challenging to identify, manage, and quantify, a reputation risk management function is particularly important.

The Firm's reputation risk management function includes the following activities:

- Maintaining a Firmwide Reputation Risk Governance policy and standard consistent with the reputation risk framework
- Overseeing the governance execution through processes and infrastructure that support consistent identification, escalation, management and monitoring of reputation risk issues Firmwide

The types of events that result in reputation risk are wide-ranging and may be introduced by the Firm's employees and the clients, customers and counterparties with which the Firm does business. These events could result in financial losses, litigation and regulatory fines, as well as other harm to the Firm.

Governance and oversight

The Reputation Risk Governance policy establishes the principles for managing reputation risk for the Firm. It is the responsibility of employees in each LOB and Corporate to consider the reputation of the Firm when deciding whether to offer a new product, engage in a transaction or client relationship, enter a new jurisdiction, initiate a business process or consider any other activity. Sustainability, social responsibility and environmental impacts are important considerations in assessing the Firm's reputation risk, and are a component of the Firm's reputation risk governance.

Reputation risk issues deemed material are escalated as appropriate.

CREDIT AND INVESTMENT RISK MANAGEMENT

Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments, including consumer credit risk, wholesale credit risk, and investment portfolio risk.

Credit risk management

Credit risk is the risk associated with the default or change in credit profile of a client, counterparty or customer. The Firm provides credit to a variety of customers, ranging from large corporate and institutional clients to individual consumers and small businesses. In its consumer businesses, the Firm is exposed to credit risk primarily through its home lending, credit card, auto, and business banking businesses. In its wholesale businesses, the Firm is exposed to credit risk through its underwriting, lending, market-making, and hedging activities with and for clients and counterparties, as well as through its operating services activities (such as cash management and clearing activities), and securities financing activities. The Firm is also exposed to credit risk through its investment securities portfolio and cash placed with banks.

Credit Risk Management monitors, measures and manages credit risk throughout the Firm and defines credit risk policies and procedures. The Firm's credit risk management governance includes the following activities:

- Maintaining a credit risk policy framework
- Monitoring, measuring and managing credit risk across all portfolio segments, including transaction and exposure approval
- Setting industry and geographic concentration limits, as appropriate, and establishing underwriting guidelines
- Assigning and managing credit authorities in connection with the approval of credit exposure
- Managing criticized exposures and delinquent loans, and
- Estimating credit losses and supporting appropriate credit risk-based capital management

Risk identification and measurement

To measure credit risk, the Firm employs several methodologies for estimating the likelihood of obligor or counterparty default. Methodologies for measuring credit risk vary depending on several factors, including type of asset (e.g., consumer versus wholesale), risk measurement parameters (e.g., delinquency status and borrower's credit score versus wholesale risk-rating) and risk management and collection processes (e.g., retail collection center versus centrally managed workout groups). Credit risk measurement is based on the probability of default of an obligor or counterparty, the loss severity given a default event and the exposure at default.

Based on these factors and the methodology and estimates described in Note 13 and Note 10, the Firm estimates credit losses for its exposures. The allowance for loan losses reflects estimated credit losses related to the consumer and wholesale held-for-investment loan portfolios, the allowance for lending-related commitments reflects estimated credit losses related to the Firm's lending-related commitments and the allowance for investment securities reflects estimated credit losses related to the investment securities portfolio. Refer to Note 13, Note 10 and Critical Accounting Estimates used by the Firm on pages 150-153 for further information.

In addition, potential and unexpected credit losses are reflected in the allocation of credit risk capital and represent the potential volatility of actual losses relative to the established allowances for loan losses and lending-related commitments. The analyses for these losses include stress testing that considers alternative economic scenarios as described below.

Stress testing

Stress testing is important in measuring and managing credit risk in the Firm's credit portfolio. The stress testing process assesses the potential impact of alternative economic and business scenarios on estimated credit losses for the Firm. Economic scenarios and the underlying parameters are defined centrally, articulated in terms of macroeconomic factors and applied across the businesses. The stress test results may indicate credit migration, changes in delinquency trends and potential losses in the credit portfolio. In addition to the periodic stress testing processes, management also considers additional stresses outside these scenarios, including industry and country-specific stress scenarios, as necessary. The Firm uses stress testing to inform decisions on setting risk appetite both at a Firm and LOB level, as well as to assess the impact of stress on individual counterparties.

Risk monitoring and management

The Firm has developed policies and practices that are designed to preserve the independence and integrity of the approval and decision-making process for extending credit to ensure credit risks are assessed accurately, approved properly, monitored regularly and managed actively at both the transaction and portfolio levels. The policy framework establishes credit approval authorities, concentration limits, risk-rating methodologies, portfolio review parameters and guidelines for management of distressed exposures. In addition, certain models, assumptions and inputs used in evaluating and monitoring credit risk are independently validated by groups that are separate from the LOBs.

Consumer credit risk is monitored for delinquency and other trends, including any concentrations at the portfolio level, as certain of these trends can be addressed through changes in underwriting policies and portfolio guidelines. Consumer Risk Management evaluates delinquency and other trends against business expectations, current and forecasted economic conditions, and industry benchmarks. Historical and forecasted economic performance and trends are incorporated into the modeling of estimated consumer credit losses and are part of the monitoring of the credit risk profile of the portfolio.

Wholesale credit risk is monitored regularly at an aggregate portfolio, industry, and individual client and counterparty level with established concentration limits that are reviewed and revised periodically as deemed appropriate by management. Industry and counterparty limits, as measured in terms of exposure and economic risk appetite, are subject to stress-based loss constraints. Wrong-way risk is the risk that exposure to a counterparty is positively correlated with the impact of a default by the same counterparty, which could cause exposure to increase at the same time as the counterparty's capacity to meet its obligations is decreasing.

Management of the Firm's wholesale credit risk exposure is accomplished through a number of means, including:

- Loan underwriting and credit approval processes
- Loan syndications and participations
- Loan sales and securitizations
- Credit derivatives
- Master netting agreements, and
- Collateral and other risk-reduction techniques

In addition to Credit Risk Management, an independent Credit Review function is responsible for:

- Independently validating or changing the risk grades assigned to exposures in the Firm's wholesale credit portfolio, and assessing the timeliness of risk grade changes initiated by responsible business units; and
- Evaluating the effectiveness of the credit management processes of the LOBs and Corporate, including the adequacy of credit analyses and risk grading/loss given default ("LGD") rationales, proper monitoring and management of credit exposures, and compliance with applicable grading policies and underwriting guidelines.

Refer to Note 12 for further discussion of consumer and wholesale loans.

Risk reporting

To enable monitoring of credit risk and effective decision-making, aggregate credit exposure, credit quality forecasts, concentration levels and risk profile changes are reported regularly to senior members of Credit Risk Management. Detailed portfolio reporting of industry, clients, counterparties and customers, product and geography are prepared, and the appropriateness of the allowance for credit losses is reviewed by senior management at least on a quarterly basis. Through the risk reporting and governance structure, credit risk trends and limit exceptions are provided regularly to, and discussed with, risk committees, senior management and the Board of Directors.

Management's discussion and analysis

CREDIT PORTFOLIO

Credit risk is the risk associated with the default or change in credit profile of a client, counterparty or customer.

In the following tables, total loans include loans retained (i.e., held-for-investment); loans held-for-sale; and certain loans accounted for at fair value. The following tables do not include loans which the Firm accounts for at fair value and classifies as trading assets; refer to Notes 2 and 3 for further information regarding these loans. Refer to Notes 12, 28, and 5 for additional information on the Firm's loans, lending-related commitments and derivative receivables, including the Firm's related accounting policies.

Refer to Note 10 for information regarding the credit risk inherent in the Firm's investment securities portfolio; and refer to Note 11 for information regarding credit risk inherent in the securities financing portfolio. Refer to Consumer Credit Portfolio on pages 110-116 and Note 12 for further discussions of the consumer credit environment and consumer loans. Refer to Wholesale Credit Portfolio on pages 117-128 and Note 12 for further discussions of the wholesale credit environment and wholesale loans.

Total credit portfolio

December 31, (in millions)	Credit exposure		Nonperforming ^{(d)(e)}	
	2021	2020	2021	2020
Loans retained	\$ 1,010,206	\$ 960,506	\$ 6,932	\$ 8,782
Loans held-for-sale	8,688	7,873	48	284
Loans at fair value	58,820	44,474	815	1,507
Total loans	1,077,714	1,012,853	7,795	10,573
Derivative receivables	57,081	75,444 ^(c)	316	56
Receivables from customers ^(a)	59,645	47,710	—	—
Total credit-related assets	1,194,440	1,136,007	8,111	10,629
Assets acquired in loan satisfactions				
Real estate owned	NA	NA	213	256
Other	NA	NA	22	21
Total assets acquired in loan satisfactions	NA	NA	235	277
Lending-related commitments	1,262,313	1,165,688	764	577
Total credit portfolio	\$ 2,456,753	\$ 2,301,695	\$ 9,110	\$ 11,483
Credit derivatives and credit-related notes used in credit portfolio management activities ^{(b)(c)}	\$ (22,218)	\$ (23,965)	\$ —	\$ —
Liquid securities and other cash collateral held against derivatives	(10,102)	(14,806)	NA	NA

- (a) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM; these are reported within accrued interest and accounts receivable on the Consolidated balance sheets.
- (b) Represents the net notional amount of protection purchased and sold through credit derivatives and credit-related notes used to manage credit exposures.
- (c) Prior-period amount has been revised to conform with the current presentation.
- (d) At December 31, 2021 and 2020, nonperforming assets excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of \$623 million and \$874 million, respectively, and real estate owned ("REO") insured by U.S. government agencies of \$5 million and \$9 million, respectively. These amounts have been excluded based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.
- (e) At December 31, 2021, nonaccrual loans excluded \$633 million of PPP loans 90 or more days past due and guaranteed by the SBA.

The following table provides information on Firmwide nonaccrual loans to total loans.

December 31, (in millions, except ratios)	2021	2020
Total nonaccrual loans	\$ 7,795	\$ 10,573
Total loans	1,077,714	1,012,853
Firmwide nonaccrual loans to total loans outstanding	0.72 %	1.04 %

The following table provides information about the Firm's net charge-offs and recoveries.

Year ended December 31, (in millions, except ratios)	2021	2020
Net charge-offs	\$ 2,865	\$ 5,259
Average retained loans	965,271	958,303
Net charge-off rates	0.30 %	0.55 %

Customer and client assistance

The Firm provided various forms of assistance to customers and clients impacted by the COVID-19 pandemic, including payment deferrals and covenant modifications. The majority of the Firm's COVID-19 related loan modifications have not been considered troubled debt restructurings ("TDRs"). Assistance provided in response to the COVID-19 pandemic could delay the recognition of delinquencies, nonaccrual status, and net charge-offs for those customers and clients who would have otherwise moved into past due or nonaccrual status. Refer to Consumer Credit Portfolio on pages 110-116 and Wholesale Credit Portfolio on pages 117-128 for information on loan modifications as of December 31, 2021. Refer to Notes 12 and 13 for further information on the Firm's accounting policies for loan modifications and the allowance for credit losses.

Paycheck Protection Program

The PPP, established by the CARES Act and implemented by the SBA, provided the Firm with delegated authority to process and originate PPP loans. When certain criteria are met, PPP loans are subject to forgiveness and the Firm will receive payment of the forgiveness amount from the SBA. PPP loans have a contractual term of two or five years and provide borrowers with an automatic payment deferral of principal and interest. The SBA will pay accrued interest through the payment deferral period and additional interest up to a maximum of 120 days past due. Based upon these servicing guidelines, the Firm continues to accrue interest for PPP loans 90 or more days past due until delinquency reaches 120 days past due. PPP processing fees are deferred and accreted into interest income over the contractual life of the loans, but may be accelerated upon forgiveness or prepayment.

At December 31, 2021 and 2020, the Firm had \$6.7 billion and \$27.2 billion, respectively, of PPP loans, including \$5.4 billion and \$19.2 billion, respectively, in consumer, and \$1.3 billion and \$8.0 billion, respectively, in wholesale. The PPP ended for new applications on May 31, 2021.

As of December 31, 2021, approximately \$34 billion of PPP loans have been repaid through payments of forgiveness amounts to the Firm from the SBA. During the year ended December 31, 2021, this resulted in accelerated recognition in interest income of the associated deferred processing fees, primarily in CCB.

At December 31, 2021, \$633 million of PPP loans 90 or more days past due have been excluded from the Firm's nonaccrual loans as they are guaranteed by the SBA.

Refer to CCB segment results on pages 63-66 and Note 12 for a further discussion of the PPP.

Management's discussion and analysis

CONSUMER CREDIT PORTFOLIO

The Firm's retained consumer portfolio consists primarily of residential real estate loans, credit card loans, scored auto and business banking loans, as well as associated lending-related commitments. The Firm's focus is on serving primarily the prime segment of the consumer credit market. Originated mortgage loans are retained in the residential real estate portfolio, securitized or sold to U.S. government agencies and U.S. government-sponsored enterprises; other types of consumer loans are typically retained on the balance sheet. The credit performance of the consumer portfolio, including net charge-offs continued to benefit from the improvement in the macroeconomic environment during 2021. Refer to Note 12 for further information on the consumer loan portfolio. Refer to Note 28 for further information on lending-related commitments.

The following tables present consumer credit-related information with respect to the scored credit portfolio held in CCB, AWM, CIB and Corporate.

Consumer credit portfolio

December 31, (in millions)	Credit exposure		Nonaccrual loans ^{(j)(k)(l)}	
	2021	2020	2021	2020
Consumer, excluding credit card				
Residential real estate ^(a)	\$ 224,795	\$ 225,302	\$ 4,759	\$ 5,313
Auto and other ^{(b)(c)(d)}	70,761	76,825	119	151
Total loans - retained	295,556	302,127	4,878	5,464
Loans held-for-sale	1,287	1,305	—	—
Loans at fair value ^(e)	26,463	15,147	472	1,003
Total consumer, excluding credit card loans	323,306	318,579	5,350	6,467
Lending-related commitments ^(f)	45,334	57,319		
Total consumer exposure, excluding credit card	368,640	375,898		
Credit Card				
Loans retained ^(g)	154,296	143,432	NA	NA
Loans held-for-sale	—	784	NA	NA
Total credit card loans	154,296	144,216	NA	NA
Lending-related commitments ^{(f)(h)}	730,534	658,506		
Total credit card exposure^(h)	884,830	802,722		
Total consumer credit portfolio^(h)	\$ 1,253,470	\$ 1,178,620	\$ 5,350	\$ 6,467
Credit-related notes used in credit portfolio management activities ⁽ⁱ⁾	\$ (2,028)	\$ (747)		

(in millions, except ratios)	Year ended December 31,					
	Net charge-offs/(recoveries)		Average loans - retained		Net charge-off/(recovery) rate ^(m)	
	2021	2020	2021	2020	2021	2020
Consumer, excluding credit card						
Residential real estate	\$ (275)	\$ (164)	\$ 220,914	\$ 235,300	(0.12)%	(0.07)%
Auto and other	286	338	77,900	66,705	0.37	0.51
Total consumer, excluding credit card - retained	11	174	298,814	302,005	—	0.06
Credit card - retained	2,712	4,286	139,900	146,391	1.94	2.93
Total consumer - retained	\$ 2,723	\$ 4,460	\$ 438,714	\$ 448,396	0.62 %	0.99 %

- (a) Includes scored mortgage and home equity loans held in CCB and AWM, and scored mortgage loans held in Corporate.
- (b) At December 31, 2021 and 2020, excluded operating lease assets of \$17.1 billion and \$20.6 billion, respectively. These operating lease assets are included in other assets on the Firm's Consolidated balance sheets. Refer to Note 18 for further information.
- (c) Includes scored auto and business banking loans and overdrafts.
- (d) At December 31, 2021 and 2020, included \$5.4 billion and \$19.2 billion of loans, respectively, in Business Banking under the PPP. The Firm does not expect to realize material credit losses on PPP loans because the loans are guaranteed by the SBA. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.
- (e) Includes scored mortgage loans held in CCB and CIB.
- (f) Credit card, home equity and certain business banking lending-related commitments represent the total available lines of credit for these products. The Firm has not experienced, and does not anticipate, that all available lines of credit would be used at the same time. For credit card commitments, and if certain conditions are met, home equity commitments and certain business banking commitments, the Firm can reduce or cancel these lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. Refer to Note 28 for further information.
- (g) Includes billed interest and fees.
- (h) Also includes commercial card lending-related commitments primarily in CB and CIB.
- (i) Represents the notional amount of protection obtained through the issuance of credit-related notes that reference certain pools of residential real estate and auto loans in the retained consumer portfolio.
- (j) At December 31, 2021 and 2020, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of \$623 million and \$874 million, respectively. These amounts have been excluded from nonaccrual loans based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status, as permitted by regulatory guidance.
- (k) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.
- (l) At December 31, 2021, nonaccrual loans excluded \$506 million of PPP loans 90 or more days past due and guaranteed by the SBA.
- (m) Average consumer loans held-for-sale and loans at fair value were \$29.1 billion and \$18.3 billion for the years ended December 31, 2021 and 2020, respectively. These amounts were excluded when calculating net charge-off/(recovery) rates.

Management's discussion and analysis

Maturities and sensitivity to changes in interest rates

The table below sets forth loan maturities and the distribution between fixed and floating interest rates based on the stated terms of the loan agreements.

December 31, 2021 (in millions)	Within 1 year	1-5 years	5-15 years	After 15 years	Total
Consumer, excluding credit card					
Residential real estate	\$ 132	\$ 615	\$ 21,481	\$ 230,078	\$ 252,306
Auto and other	3,819 ^(b)	42,370	24,771	40	71,000
Total consumer, excluding credit card loans	3,951	42,985	46,252	230,118	323,306
Total credit card loans	153,354	942 ^(a)	—	—	154,296
Total consumer loans	\$ 157,305	\$ 43,927	\$ 46,252	\$ 230,118	\$ 477,602
Loans due after one year at fixed interest rates					
Residential real estate		\$ 388	\$ 10,991	\$ 155,510	
Auto and other		42,275	24,376	36	
Credit card		942	—	—	
Loans due after one year at variable interest rates^(a)					
Residential real estate		227	10,490	74,568	
Auto and other		95	395	4	
Total consumer loans		\$ 43,927	\$ 46,252	\$ 230,118	

(a) Credit card loans with maturities greater than one year represent TDRs and are at fixed interest rates. There are no credit card loans due after one year at variable interest rates.

(b) Includes overdrafts.

Consumer assistance

In March 2020, the Firm began providing assistance to customers in response to the COVID-19 pandemic, predominantly in the form of payment deferrals.

As of December 31, 2021 and 2020, the Firm had approximately \$1.3 billion and \$10.7 billion, respectively, of retained consumer loans under payment deferral programs, predominantly in residential real estate, compared to approximately \$28.3 billion at June 30, 2020. During the fourth quarter of 2021, there were approximately \$386 million of new enrollments in consumer payment deferral programs. Predominantly all borrowers that exited payment deferral programs are current. The Firm continues to monitor the credit risk associated with loans subject to payment deferrals throughout the deferral period and on an ongoing basis after the borrowers are required to resume making regularly scheduled payments, and considers expected losses of principal and accrued interest on these loans in its allowance for credit losses.

Of the \$1.3 billion of retained loans under payment deferral programs as of December 31, 2021, approximately \$611 million were accounted for as TDRs prior to payment deferral and approximately \$40 million were accounted for as TDRs because they did not qualify for or the Firm did not elect to suspend TDR accounting guidance under the option provided by the CARES Act, as extended by the Consolidated Appropriations Act and which expired on January 1, 2022. Borrowers that are unable to resume or continue making payments in accordance with the original or modified contractual terms of their agreements upon exit from deferral programs will be placed on nonaccrual status in line with the Firm's nonaccrual policy, except for credit cards as permitted by regulatory guidance, and the loans charged off or down in accordance with the Firm's charge-off policies. Refer to Note 12 for additional information on the Firm's nonaccrual and charge-off policies.

Consumer, excluding credit card

Portfolio analysis

Loans increased from December 31, 2020 driven by higher residential real estate loans at fair value, largely offset by lower auto and other loans.

The following discussions provide information concerning individual loan products. Refer to Note 12 for further information about this portfolio, including information about delinquencies, loan modifications and other credit quality indicators.

Residential real estate: The residential real estate portfolio, including loans held-for-sale and loans at fair value, predominantly consists of prime mortgage loans and home equity lines of credit.

Retained loans were relatively flat compared to December 31, 2020 as the decline in Home Lending driven by paydowns outpacing originations of prime mortgage loans was predominantly offset by growth in AWM. Retained nonaccrual loans decreased from December 31, 2020 reflecting improved credit performance. Net recoveries for the year ended December 31, 2021 were higher when compared with the prior year as the current year benefited from further improvement in HPI and higher reversals of prior write-downs due to prepayments as a result of the low rate environment.

Loans at fair value increased from December 31, 2020, reflecting loan purchase activity in CIB driven by higher client demand, as well as increased originations in Home Lending due to the continued low rate environment. Nonaccrual loans at fair value decreased from December 31, 2020 due to sales in CIB.

The carrying value of home equity lines of credit outstanding was \$18.7 billion at December 31, 2021. This amount included \$6.2 billion of HELOCs that have recast from interest-only to fully amortizing payments or have been modified and \$6.0 billion of interest-only balloon HELOCs, which primarily mature after 2030. The Firm manages the risk of HELOCs during their revolving period by closing or reducing the undrawn line to the extent permitted by law when borrowers are exhibiting a material deterioration in their credit risk profile.

At December 31, 2021 and 2020, the carrying value of interest-only residential mortgage loans were \$30.0 billion and \$25.6 billion, respectively. These loans have an interest-only payment period generally followed by an adjustable-rate or fixed-rate fully amortizing payment period to maturity and are typically originated as higher-balance loans to higher-income borrowers, predominantly in AWM. The interest-only residential mortgage loan portfolio reflected net recoveries for the year ended December 31, 2021, in line with the performance of the broader prime mortgage portfolio.

The following table provides a summary of the Firm's residential mortgage portfolio insured and/or guaranteed by U.S. government agencies, predominantly loans held-for-sale and loans at fair value. The Firm monitors its exposure to certain potential unrecoverable claim payments related to government-insured loans and considers this exposure in estimating the allowance for loan losses.

(in millions)	December 31, 2021	December 31, 2020
Current	\$ 689	\$ 669
30-89 days past due	135	235
90 or more days past due	623	874
Total government guaranteed loans	\$ 1,447	\$ 1,778

Geographic composition and current estimated loan-to-value ratio of residential real estate loans

At December 31, 2021, \$145.5 billion, or 65% of the total retained residential real estate loan portfolio, excluding mortgage loans insured by U.S. government agencies, were concentrated in California, New York, Florida, Texas and Illinois, compared with \$146.6 billion, or 65% at December 31, 2020.

Average current estimated loan-to-value ("LTV") ratios have declined consistent with recent improvements in home prices and customer pay-downs.

Refer to Note 12 for information on the geographic composition and current estimated LTVs of the Firm's residential real estate loans.

Management's discussion and analysis

Modified residential real estate loans

The following table presents information relating to modified retained residential real estate loans for which concessions have been granted to borrowers experiencing financial difficulty, which include both TDRs and modified PCD loans not accounted for as TDRs. The following table does not include loans with short-term or other insignificant modifications that are not considered concessions and, therefore, are not TDRs, or loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act. Refer to Note 12 for further information on modifications for the years ended December 31, 2021 and 2020.

(in millions)	December 31, 2021	December 31, 2020
Retained loans	\$ 13,251	\$ 15,406
Nonaccrual retained loans ^(a)	3,938	3,899

(a) At December 31, 2021 and 2020, nonaccrual loans included \$2.7 billion and \$3.0 billion, respectively, of TDRs for which the borrowers were less than 90 days past due. Refer to Note 12 for additional information about loans modified in a TDR that are on nonaccrual status.

Auto and other: The auto and other loan portfolio, including loans at fair value, predominantly consists of prime-quality scored auto and business banking loans, as well as overdrafts. The portfolio decreased when compared with December 31, 2020 due to a decrease in business banking loans largely offset by growth in the scored auto portfolio. Business Banking loans declined predominantly due to PPP loan forgiveness, partially offset by originations. The increase in the scored auto portfolio was driven by loan originations predominantly offset by paydowns. Net charge-offs for the year ended December 31, 2021 decreased when compared to the prior year driven by lower scored auto charge-offs as the current year benefited from higher vehicle collateral values and elevated consumer cash balances, partially offset by higher overdraft charge-offs. The scored auto portfolio net charge-off rates were 0.04% and 0.25% for the years ended December 31, 2021 and 2020, respectively.

Nonperforming assets

The following table presents information as of December 31, 2021 and 2020, about consumer, excluding credit card, nonperforming assets.

Nonperforming assets ^(a)		
December 31, (in millions)	2021	2020
Nonaccrual loans		
Residential real estate ^(b)	\$ 5,231	\$ 6,316
Auto and other	119 ^(c)	151
Total nonaccrual loans	5,350	6,467
Assets acquired in loan satisfactions		
Real estate owned	112	131
Other	22	21
Total assets acquired in loan satisfactions	134	152
Total nonperforming assets	\$ 5,484	\$ 6,619

- (a) At December 31, 2021 and 2020, nonperforming assets excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of \$623 million and \$874 million, respectively, and REO insured by U.S. government agencies of \$5 million and \$9 million, respectively. These amounts have been excluded based upon the government guarantee.
- (b) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.
- (c) At December 31, 2021, nonaccrual loans excluded \$506 million of PPP loans 90 or more days past due and guaranteed by the SBA.

Nonaccrual loans

The following table presents changes in consumer, excluding credit card, nonaccrual loans for the years ended December 31, 2021 and 2020.

Nonaccrual loan activity

Year ended December 31, (in millions)	2021	2020
Beginning balance	\$ 6,467	\$ 3,366
Additions:		
PCD loans, upon adoption of CECL	NA	708
Other additions	2,956	5,184 ^(b)
Total additions	2,956	5,892
Reductions:		
Principal payments and other ^(a)	2,018	983
Charge-offs	229	390
Returned to performing status	1,716	1,024
Foreclosures and other liquidations	110	394
Total reductions	4,073	2,791
Net changes	(1,117)	3,101
Ending balance	\$ 5,350	\$ 6,467

(a) Other reductions includes loan sales.

(b) Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.

Refer to Note 12 for further information about the consumer credit portfolio, including information about delinquencies, other credit quality indicators, loan modifications and loans that were in the process of active or suspended foreclosure.

Purchased credit deteriorated (“PCD”) loans

The following tables provide credit-related information for PCD loans which are reported in residential real estate.

(in millions, except ratios)	December 31, 2021	December 31, 2020
Loan delinquency ^(a)		
Current	\$ 12,746	\$ 16,036
30-149 days past due	331	432
150 or more days past due	664	573
Total PCD loans	\$ 13,741	\$ 17,041
% of 30+ days past due to total retained PCD loans	7.24 %	5.90 %
Nonaccrual loans ^(b)	\$ 1,616	\$ 1,609
Year ended December 31, (in millions, except ratios)	2021	2020
Net charge-offs	\$ 15	\$ 74
Net charge-off rate	0.10 %	0.39 %

(a) At December 31, 2021 and 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.

(b) Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.

Management's discussion and analysis

Credit card

Total credit card loans increased from December 31, 2020 reflecting strong sales volume predominantly offset by higher payments. The December 31, 2021 30+ and 90+ day delinquency rates of 1.04% and 0.50%, respectively, decreased compared to the December 31, 2020 30+ and 90+ day delinquency rates of 1.68% and 0.92%, respectively. The delinquency rates continue to benefit from the ongoing impact of government stimulus and support provided to borrowers who participated in payment assistance programs. Net charge-offs decreased for the year ended December 31, 2021 compared with the prior year reflecting lower charge-offs and higher recoveries as consumer cash balances remained elevated.

Consistent with the Firm's policy, all credit card loans typically remain on accrual status until charged off. However, the Firm's allowance for loan losses includes the estimated uncollectible portion of accrued and billed interest and fee income. Refer to Note 12 for further information about this portfolio, including information about delinquencies.

Geographic and FICO composition of credit card loans

At December 31, 2021, \$70.5 billion, or 46% of the total retained credit card loan portfolio, was concentrated in California, Texas, New York, Florida and Illinois, compared with \$65.0 billion, or 45%, at December 31, 2020. Refer to Note 12 for additional information on the geographic and FICO composition of the Firm's credit card loans.

Modifications of credit card loans

At December 31, 2021, the Firm had \$1.0 billion of credit card loans outstanding that have been modified in TDRs, which does not include loans with short-term or other insignificant modifications that are not considered TDRs, compared to \$1.4 billion at December 31, 2020. Refer to Note 12 for additional information about loan modification programs to borrowers.

WHOLESALE CREDIT PORTFOLIO

In its wholesale businesses, the Firm is exposed to credit risk primarily through its underwriting, lending, market-making, and hedging activities with and for clients and counterparties, as well as through various operating services (such as cash management and clearing activities), securities financing activities and cash placed with banks. A portion of the loans originated or acquired by the Firm's wholesale businesses is generally retained on the balance sheet. The Firm distributes a significant percentage of the loans that it originates into the market as part of its syndicated loan business and to manage portfolio concentrations and credit risk. The wholesale portfolio is actively managed, in part by conducting ongoing, in-depth reviews of client credit quality and transaction structure inclusive of collateral where applicable, and of industry, product and client concentrations. Refer to the industry discussion on pages 119-123 for further information.

The Firm's wholesale credit portfolio includes exposure held in CIB, CB, AWM and Corporate, as well as risk-rated exposures held in CCB, including business banking and auto dealer exposure for which the wholesale methodology is applied when determining the allowance for credit losses.

In 2021 the credit environment continued to improve following the broad-based deterioration during the earlier stages of the COVID-19 pandemic.

As of December 31, 2021, retained loans increased \$45.4 billion driven by CIB and AWM, partially offset by decreases in CCB. Lending-related commitments increased \$36.6 billion, predominantly driven by net portfolio activity in CB and CIB, including an increase in held for sale commitments intended to be syndicated.

As of December 31, 2021, the investment-grade percentage of the portfolio remained relatively flat at 71%, while criticized exposure decreased \$3.4 billion from \$41.6 billion to \$38.2 billion. The decrease in criticized exposure was driven by net portfolio activity and client-specific upgrades, primarily in Oil & Gas and Automotive, largely offset by client-specific downgrades. Nonperforming exposure decreased \$1.2 billion driven by lower nonperforming loans, primarily in Oil & Gas and Individuals and Individual Entities, with net portfolio activity and client-specific upgrades partially offset by client-specific downgrades. The decrease in nonperforming loans was partially offset by increases in derivatives and lending-related commitments.

Wholesale credit portfolio

December 31, (in millions)	Credit exposure		Nonperforming ^(d)	
	2021	2020	2021	2020
Loans retained	\$ 560,354	\$ 514,947	\$ 2,054	\$ 3,318
Loans held-for-sale	7,401	5,784	48	284
Loans at fair value	32,357	29,327	343	504
Loans	600,112	550,058	2,445	4,106
Derivative receivables	57,081	75,444 ^(c)	316	56
Receivables from customers ^(a)	59,645	47,710	—	—
Total wholesale credit-related assets	716,838	673,212	2,761	4,162
Assets acquired in loan satisfactions				
Real estate owned	NA	NA	101	125
Other	NA	NA	—	—
Total assets acquired in loan satisfactions	NA	NA	101	125
Lending-related commitments	486,445	449,863	764	577
Total wholesale credit portfolio	\$1,203,283	\$1,123,075	\$ 3,626	\$ 4,864
Credit derivatives and credit-related notes used in credit portfolio management activities ^(b)	\$ (20,190)	\$ (23,218) ^(c)	\$ —	\$ —
Liquid securities and other cash collateral held against derivatives	(10,102)	(14,806)	NA	NA

- (a) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM; these are reported within accrued interest and accounts receivable on the Consolidated balance sheets.
- (b) Represents the net notional amount of protection purchased and sold through credit derivatives and credit-related notes used to manage both performing and nonperforming wholesale credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. Refer to Credit derivatives on page 128 and Note 5 for additional information.
- (c) Prior-period amounts have been revised to conform with the current presentation.
- (d) Loans that were modified in response to the COVID-19 pandemic continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2021, predominantly all of these loans were considered performing.

Management's discussion and analysis

Wholesale assistance

In March 2020, the Firm began providing assistance to clients in response to the COVID-19 pandemic, predominantly in the form of payment deferrals and covenant modifications.

As of December 31, 2021 and 2020, the Firm had approximately \$107 million and \$1.6 billion, respectively, of retained loans under payment deferral programs, compared to \$16.8 billion at June 30, 2020. Predominantly all clients that exited deferral are current or have paid down their loans. The Firm continues to monitor the credit risk associated with loans subject to deferrals throughout the deferral period and on an ongoing basis after the borrowers are required to resume making regularly scheduled payments, and considers expected losses of

principal and accrued interest on these loans in its allowance for credit losses.

In addition, the Firm granted assistance in the form of covenant modifications. These types of assistance, both payment deferrals and covenant modifications, are generally not reported as TDRs, either because the modifications were insignificant or they qualified to suspend TDR accounting guidance under the option provided by the CARES Act, as extended by the Consolidated Appropriations Act and which expired on January 1, 2022. Loans under assistance continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2021, substantially all of these loans were considered performing.

Wholesale credit exposure - maturity and ratings profile

The following tables present the maturity and internal risk ratings profiles of the wholesale credit portfolio as of December 31, 2021 and 2020. The Firm generally considers internal ratings with qualitative characteristics equivalent to BBB-/Baa3 or higher as investment grade, and takes into consideration collateral and structural support when determining the internal risk rating for each credit facility. Refer to Note 12 for further information on internal risk ratings.

December 31, 2021 (in millions, except ratios)	Maturity profile ^(e)				Ratings profile			
	1 year or less	After 1 year through 5 years	After 5 years	Total	Investment-grade	Noninvestment-grade	Total	Total % of IG
Loans retained	\$ 214,064	\$ 218,176	\$ 128,114	\$ 560,354	\$ 410,011	\$ 150,343	\$ 560,354	73 %
Derivative receivables				57,081			57,081	
Less: Liquid securities and other cash collateral held against derivatives				(10,102)			(10,102)	
Total derivative receivables, net of collateral	13,648	12,814	20,517	46,979	31,934	15,045	46,979	68
Lending-related commitments	120,929	340,308	25,208	486,445	331,116	155,329	486,445	68
Subtotal	348,641	571,298	173,839	1,093,778	773,061	320,717	1,093,778	71
Loans held-for-sale and loans at fair value ^(a)				39,758			39,758	
Receivables from customers				59,645			59,645	
Total exposure - net of liquid securities and other cash collateral held against derivatives				\$ 1,193,181			\$ 1,193,181	
Credit derivatives and credit-related notes used in credit portfolio management activities ^{(b)(c)(d)}	\$ (7,509)	\$ (10,414)	\$ (2,267)	\$ (20,190)	\$ (15,559)	\$ (4,631)	\$ (20,190)	77 %

December 31, 2020 (in millions, except ratios)	Maturity profile ^(e)				Ratings profile			
	1 year or less	After 1 year through 5 years	After 5 years	Total	Investment-grade	Noninvestment-grade	Total	Total % of IG
Loans retained	\$ 183,969	\$ 197,905	\$ 133,073	\$ 514,947	\$ 379,273	\$ 135,674	\$ 514,947	74 %
Derivative receivables				75,444 ^(d)			75,444 ^(d)	
Less: Liquid securities and other cash collateral held against derivatives				(14,806)			(14,806)	
Total derivative receivables, net of collateral	17,750	14,478	28,410	60,638	38,941	21,697	60,638	64
Lending-related commitments	116,950	315,179	17,734	449,863	312,694	137,169	449,863	70
Subtotal	318,669	527,562	179,217	1,025,448	730,908	294,540	1,025,448	71
Loans held-for-sale and loans at fair value ^(a)				35,111			35,111	
Receivables from customers				47,710			47,710	
Total exposure - net of liquid securities and other cash collateral held against derivatives				\$ 1,108,269			\$ 1,108,269	
Credit derivatives and credit-related notes used in credit portfolio management activities ^{(b)(c)(d)}	\$ (6,765)	\$ (13,627)	\$ (2,826)	\$ (23,218)	\$ (18,164)	\$ (5,054)	\$ (23,218)	78 %

(a) Loans held-for-sale are primarily related to syndicated loans and loans transferred from the retained portfolio.

(b) These derivatives do not qualify for hedge accounting under U.S. GAAP.

- (c) The notional amounts are presented on a net basis by underlying reference entity and the ratings profile shown is based on the ratings of the reference entity on which protection has been purchased. Predominantly all of the credit derivatives entered into by the Firm where it has purchased protection used in credit portfolio management activities are executed with investment-grade counterparties. In addition, the Firm obtains credit protection against certain loans in the retained loan portfolio through the issuance of credit-related notes.
- (d) Prior-period amounts have been revised to conform with the current presentation.
- (e) The maturity profile of retained loans, lending-related commitments and derivative receivables is generally based on remaining contractual maturity. Derivative contracts that are in a receivable position at December 31, 2021, may become payable prior to maturity based on their cash flow profile or changes in market conditions.

Wholesale credit exposure – industry exposures

The Firm focuses on the management and diversification of its industry exposures, and pays particular attention to industries with actual or potential credit concerns.

Exposures deemed criticized align with the U.S. banking regulators' definition of criticized exposures, which consist of the special mention, substandard and doubtful categories. Total criticized exposure, excluding loans held-for-sale and loans at fair value, was \$38.2 billion at December 31, 2021 and \$41.6 billion at December 31, 2020, representing approximately 3.5% and 4.0% of total wholesale credit exposure, respectively. The decrease in criticized exposure was driven by net portfolio activity and client-specific upgrades, primarily in Oil & Gas and Automotive, largely offset by client-specific downgrades. The \$38.2 billion of criticized exposure at December 31, 2021 was largely undrawn and \$35.0 billion was performing.

Management's discussion and analysis

The table below summarizes by industry the Firm's exposures as of December 31, 2021 and 2020. The industry of risk category is generally based on the client or counterparty's primary business activity. Refer to Note 4 for additional information on industry concentrations.

Wholesale credit exposure - industries^(a)

As of or for the year ended December 31, 2021 (in millions)	Selected metrics								
	Credit exposure ^{(f)(g)}	Investment-grade	Noninvestment-grade			30 days or more past due and accruing loans ^(h)	Net charge-offs/ (recoveries)	Credit derivative hedges and credit-related notes ⁽ⁱ⁾	Liquid securities and other cash collateral held against derivative receivables
			Noncriticized	Criticized performing	Criticized nonperforming				
Real Estate	\$ 155,069	\$ 120,174	\$ 29,642	\$ 4,636	\$ 617	\$ 394	\$ 6	\$ (190)	\$ -
Individuals and Individual Entities ^(b)	141,973	122,606	18,797	99	471	1,450	32	-	(1)
Consumer & Retail	122,789	59,622	53,317	9,445	405	288	2	(357)	-
Technology, Media & Telecommunications	84,070	49,610	25,540	8,595	325	58	(1)	(935)	(12)
Asset Managers	81,228	68,593	12,630	-	5	8	-	-	(3,900)
Industrials	66,974	36,953	26,957	2,895	169	428	13	(608)	(1)
Healthcare	59,014	42,133	15,136	1,686	59	204	(4)	(490)	(174)
Banks & Finance Cos	54,684	29,732	23,809	1,138	5	9	9	(553)	(810)
Oil & Gas	42,606	20,698	20,222	1,558	128	4	60	(582)	-
Automotive	34,573	24,606	9,446	399	122	95	(3)	(463)	-
State & Municipal Govt ^(c)	33,216	32,522	586	101	7	74	-	-	(14)
Utilities	33,203	25,069	7,011	914	209	11	6	(382)	(4)
Chemicals & Plastics	17,660	11,319	5,817	518	6	7	-	(67)	-
Metals & Mining	16,696	7,848	8,491	294	63	27	7	(15)	(4)
Transportation	14,635	6,010	5,983	2,470	172	21	20	(110)	(24)
Insurance	13,926	9,943	3,887	96	-	-	-	(25)	(2,366)
Central Govt	11,317	11,067	250	-	-	-	-	(7,053)	(72)
Financial Markets Infrastructure	4,377	3,987	390	-	-	-	-	-	-
Securities Firms	4,180	2,599	1,578	-	3	-	-	(47)	(217)
All other ^(d)	111,690	97,537	13,580	205	368	242	(5)	(8,313)	(2,503)
Subtotal	\$ 1,103,880	\$ 782,628	\$ 283,069	\$ 35,049	\$ 3,134	\$ 3,320	\$ 142	\$ (20,190)	\$ (10,102)
Loans held-for-sale and loans at fair value	39,758								
Receivables from customers	59,645								
Total^(e)	\$ 1,203,283								

As of or for the year ended December 31, 2020 (in millions)	Selected metrics								
	Credit exposure ^{(f)(g)}	Investment- grade	Noninvestment-grade			30 days or more past due and accruing loans ^(f)	Net charge- offs/ (recoveries)	Credit derivative hedges and credit- related notes ^{(h)(i)}	Liquid securities and other cash collateral held against derivative receivables
			Noncriticized	Criticized performing	Criticized nonperforming				
Real Estate	\$ 148,498	\$ 116,124	\$ 27,576	\$ 4,294	\$ 504	\$ 374	\$ 94	\$ (190)	\$ –
Individuals and Individual Entities ^(b)	122,870	107,266	14,688	227	689	1,570	(17)	–	–
Consumer & Retail	108,437	57,580	41,624	8,852	381	203	55	(381)	(5)
Technology, Media & Telecommunications	72,150	36,435	27,770	7,738	207	10	73	(984)	(56)
Asset Managers	66,573	57,582	8,885	85	21	19	1	–	(4,685)
Industrials	66,470	37,512	26,881	1,852	225	278	70	(658)	(61)
Healthcare	60,118	44,901	13,356	1,684	177	96	104	(378)	(191)
Banks & Finance Cos	54,032	35,115	17,820	1,045	52	20	13	(659)	(1,648)
Oil & Gas	39,159	18,456	14,969	4,952	782	11	249	(488)	(4)
Automotive	43,331	25,548	15,575	2,149	59	152	22	(434)	–
State & Municipal Govt ^(c)	38,286	37,705	574	2	5	41	–	–	(41)
Utilities	30,124	22,451	7,048	571	54	14	(7)	(402)	(1)
Chemicals & Plastics	17,176	10,622	5,703	822	29	6	–	(83)	–
Metals & Mining	15,542	5,958	8,699	704	181	8	16	(141)	(13)
Transportation	16,232	7,549	6,340	2,137	206	30	117	(83)	(26)
Insurance	13,141	10,177	2,960	3	1	7	–	–	(1,771)
Central Govt	17,025	16,652	373	–	–	–	–	(8,364)	(982)
Financial Markets Infrastructure	6,515	6,449	66	–	–	–	–	–	(10)
Securities Firms	8,048	6,116	1,927	1	4	–	18	(49)	(3,423)
All other ^(d)	96,527 ^(h)	84,650	10,999 ^(h)	504	374	83	(9)	(9,924)	(1,889)
Subtotal	\$ 1,040,254	\$ 744,848	\$ 253,833	\$ 37,622	\$ 3,951	\$ 2,922	\$ 799	\$ (23,218)	\$ (14,806)
Loans held-for-sale and loans at fair value	35,111								
Receivables from customers	47,710								
Total^(e)	\$ 1,123,075								

- (a) The industry rankings presented in the table as of December 31, 2020, are based on the industry rankings of the corresponding exposures at December 31, 2021, not actual rankings of such exposures at December 31, 2020.
- (b) Individuals and Individual Entities predominantly consists of Global Private Bank clients within AWM and includes exposure to personal investment companies and personal and testamentary trusts.
- (c) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2021 and 2020, noted above, the Firm held: \$7.1 billion and \$7.2 billion, respectively, of trading assets; \$15.9 billion and \$20.4 billion, respectively, of AFS securities; and \$14.0 billion and \$12.8 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. Refer to Note 2 and Note 10 for further information.
- (d) All other includes: SPEs and Private education and civic organizations, representing approximately 94% and 6%, respectively, at December 31, 2021 and 92% and 8%, respectively, at December 31, 2020.
- (e) Excludes cash placed with banks of \$729.6 billion and \$516.9 billion, at December 31, 2021 and 2020, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.
- (f) Credit exposure is net of risk participations and excludes the benefit of credit derivatives and credit-related notes used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.
- (g) Credit exposure includes held-for-sale and fair value option elected lending-related commitments.
- (h) Prior-period amounts have been revised to conform with the current presentation.
- (i) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic.
- (j) Represents the net notional amounts of protection purchased and sold through credit derivatives and credit-related notes used to manage the credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. The All other category includes purchased credit protection on certain credit indices.

Management's discussion and analysis

Presented below is additional detail on certain of the Firm's industry exposures.

Real Estate

Real Estate exposure was \$155.1 billion as of December 31, 2021, of which \$89.2 billion was multifamily lending as shown in the table below. Criticized exposure increased by \$455 million from \$4.8 billion at December 31, 2020 to \$5.3 billion at December 31, 2021, driven by client-specific downgrades predominantly offset by client-specific upgrades and net portfolio activity.

(in millions, except ratios)	December 31, 2021				
	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn ^(d)
Multifamily ^(a)	\$ 89,032	\$ 122	\$ 89,154	84 %	89 %
Office	16,409	234	16,643	75	71
Other Income Producing Properties ^(b)	13,018	498	13,516	77	55
Industrial	11,546	66	11,612	75	64
Services and Non Income Producing	11,512	24	11,536	63	50
Retail	9,580	106	9,686	61	69
Lodging	2,859	63	2,922	5	33
Total Real Estate Exposure^(c)	\$ 153,956	\$ 1,113	\$ 155,069	77 %	77 %

(in millions, except ratios)	December 31, 2020				
	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn ^(d)
Multifamily ^(a)	\$ 85,368	\$ 183	\$ 85,551	85 %	92 %
Office	16,372	475	16,847	76	70
Other Income Producing Properties ^(b)	13,435	421	13,856	76	55
Industrial	9,039	69	9,108	76	73
Services and Non Income Producing	9,242	22	9,264	62	47
Retail	10,573	199	10,772	60	69
Lodging	3,084	16	3,100	24	57
Total Real Estate Exposure	\$ 147,113	\$ 1,385	\$ 148,498	78 %	80 %

(a) Multifamily exposure is largely in California.

(b) Other Income Producing Properties consists of clients with diversified property types or other property types outside of categories listed in the table above

(c) Real Estate exposure is approximately 78% secured; unsecured exposure is approximately 75% investment-grade.

(d) Represents drawn exposure as a percentage of credit exposure.

Consumer & Retail

Consumer & Retail exposure was \$122.8 billion as of December 31, 2021, and predominantly included Retail, Business and Consumer Services, and Food and Beverage as shown in the table below. Criticized exposure increased by \$617 million from \$9.2 billion at December 31, 2020 to \$9.9 billion at December 31, 2021, driven by client-specific downgrades and net portfolio activity largely offset by client-specific upgrades.

December 31, 2021					
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn ^(d)
Retail ^(a)	\$ 32,872	\$ 1,152	\$ 34,024	50 %	31 %
Business and Consumer Services	32,159	347	32,506	46	33
Food and Beverage	30,434	957	31,391	59	33
Consumer Hard Goods	17,035	111	17,146	46	30
Leisure ^(b)	7,620	102	7,722	17	34
Total Consumer & Retail^(c)	\$ 120,120	\$ 2,669	\$ 122,789	49 %	32 %

December 31, 2020					
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn ^(d)
Retail ^(a)	\$ 32,486	\$ 887	\$ 33,373	52 %	33 %
Business and Consumer Services	24,760	599	25,359	52	41
Food and Beverage	28,012	897	28,909	62	33
Consumer Hard Goods	12,937	178	13,115	59	36
Leisure ^(b)	7,440	241	7,681	18	43
Total Consumer & Retail	\$ 105,635	\$ 2,802	\$ 108,437	53 %	36 %

(a) Retail consists of Home Improvement & Specialty Retailers, Restaurants, Supermarkets, Discount & Drug Stores, Specialty Apparel and Department Stores.

(b) Leisure consists of Gaming, Arts & Culture, Travel Services and Sports & Recreation. As of December 31, 2021, approximately 81% of the noninvestment-grade Leisure portfolio is secured.

(c) Approximately 80% of the noninvestment-grade portfolio is secured.

(d) Represents drawn exposure as a percent of credit exposure.

Oil & Gas

Oil & Gas exposure was \$42.6 billion as of December 31, 2021, including \$23.1 billion of Exploration & Production and Oil field Services as shown in the table below. The increase in derivative receivables resulted from market movements related to Oil & Gas prices. Criticized exposure decreased by \$4.0 billion from \$5.7 billion at December 31, 2020 to \$1.7 billion at December 31, 2021, driven by net portfolio activity and client-specific upgrades partially offset by client-specific downgrades.

December 31, 2021					
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn ^(c)
Exploration & Production ("E&P") and Oil field Services	\$ 17,631	\$ 5,452	\$ 23,083	39 %	26 %
Other Oil & Gas ^(a)	18,941	582	19,523	60	26
Total Oil & Gas^(b)	\$ 36,572	\$ 6,034	\$ 42,606	49 %	26 %

December 31, 2020					
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn ^(c)
Exploration & Production ("E&P") and Oil field Services	\$ 18,228	\$ 1,048	\$ 19,276	32 %	37 %
Other Oil & Gas ^(a)	19,288	595	19,883	62	21
Total Oil & Gas^(b)	\$ 37,516	\$ 1,643	\$ 39,159	47 %	29 %

(a) Other Oil & Gas includes Integrated Oil & Gas companies, Midstream/Oil Pipeline companies and refineries.

(b) Secured exposure was \$18.0 billion and \$13.2 billion at December 31, 2021 and 2020, respectively, over half of which is reserve-based lending to the Exploration & Production sub-sector; unsecured exposure is largely investment-grade.

(c) Represents drawn exposure as a percent of credit exposure.

Management's discussion and analysis

Loans

In its wholesale businesses, the Firm provides loans to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals. Refer to Note 12 for a further discussion on loans, including information about delinquencies, loan modifications and other credit quality indicators.

The following table presents the change in the nonaccrual loan portfolio for the years ended December 31, 2021 and 2020. Since December 31, 2020, nonaccrual loan exposure decreased \$1.7 billion, largely in Oil & Gas and Individuals and Individual Entities, with net portfolio activity and client-specific upgrades partially offset by client-specific downgrades.

Wholesale nonaccrual loan activity

Year ended December 31, (in millions)	2021	2020
Beginning balance	\$ 4,106	\$ 1,271
Additions	2,909	6,753
Reductions:		
Paydowns and other	2,676	2,290
Gross charge-offs	268	922
Returned to performing status	1,106	569
Sales	520	137
Total reductions	4,570	3,918
Net changes	(1,661)	2,835
Ending balance	\$ 2,445	\$ 4,106

The following table presents net charge-offs/recoveries, which are defined as gross charge-offs less recoveries, for the years ended December 31, 2021 and 2020. The amounts in the table below do not include gains or losses from sales of nonaccrual loans recognized in noninterest revenue.

Wholesale net charge-offs/(recoveries)

Year ended December 31, (in millions, except ratios)	2021	2020
Loans		
Average loans retained	\$ 526,557	\$ 509,907
Gross charge-offs	283	954
Gross recoveries collected	(141)	(155)
Net charge-offs/(recoveries)	142	799
Net charge-off/(recovery) rate	0.03 %	0.16 %

Maturities and sensitivity to changes in interest rates

The table below sets forth wholesale loan maturities and the distribution between fixed and floating interest rates based on the stated terms of the loan agreements by loan class. Refer to Note 12 for further information on loan classes.

December 31, 2021 (in millions, except ratios)	1 year or less ^(a)	After 1 year through 5 years	After 5 years through 15 years	After 15 years	Total
Wholesale loans:					
Secured by real estate	\$ 6,587	\$ 27,559	\$ 28,624	\$ 65,542	\$ 128,312
Commercial and industrial	52,132	95,685	10,523	1,105	159,445
Other	162,600	117,886	27,427	4,442	312,355
Total wholesale loans	\$ 221,319	\$ 241,130	\$ 66,574	\$ 71,089	\$ 600,112
Loans due after one year at fixed interest rates					
Secured by real estate		\$ 3,762	\$ 9,454	\$ 2,258	
Commercial and industrial		9,129	1,025	19	
Other		18,206	16,778	3,311	
Loans due after one year at variable interest rates					
Secured by real estate		\$ 23,797	\$ 19,170	\$ 63,285	
Commercial and industrial		86,557	9,498	1,087	
Other		99,679	10,649	1,129	
Total wholesale loans		\$ 241,130	\$ 66,574	\$ 71,089	

(a) Includes demand loans and overdrafts.

The following table presents net charge-offs/recoveries, average retained loans and net charge-off/recovery rate by loan class for the year ended December 31, 2021 and 2020.

(in millions, except ratios)	Year ended December 31,							
	Secured by real estate		Commercial and industrial		Other		Total	
	2021	2020	2021	2020	2021	2020	2021	2020
Net charge-offs/(recoveries)	\$ 13	\$ 10	\$ 105	\$ 737	\$ 24	\$ 52	\$ 142	\$ 799
Average retained loans	118,417	122,435	138,015	162,554	270,125	224,918	526,557	509,907
Net charge-off/(recovery) rate	0.01 %	0.01 %	0.08 %	0.45 %	0.01 %	0.02 %	0.03 %	0.16 %

Management's discussion and analysis

Lending-related commitments

The Firm uses lending-related financial instruments, such as commitments (including revolving credit facilities) and guarantees, to address the financing needs of its clients. The contractual amounts of these financial instruments represent the maximum possible credit risk should the clients draw down on these commitments or when the Firm fulfills its obligations under these guarantees, and the clients subsequently fail to perform according to the terms of these contracts. Most of these commitments and guarantees have historically been refinanced, extended, cancelled, or expired without being drawn upon or a default occurring. As a result, the Firm does not believe that the total contractual amount of these wholesale lending-related commitments is representative of the Firm's expected future credit exposure or funding requirements. Refer to Note 28 for further information on wholesale lending-related commitments.

Receivables from customers

Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM that are collateralized by assets maintained in the clients' brokerage accounts (e.g., cash on deposit, and liquid and readily marketable debt or equity securities). Because of this collateralization, no allowance for credit losses is generally held against these receivables. To manage its credit risk the Firm establishes margin requirements and monitors the required margin levels on an ongoing basis, and requires clients to deposit additional cash or other collateral, or to reduce positions, when appropriate. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.

Derivative contracts

Derivatives enable clients and counterparties to manage risk including credit risk and risks arising from fluctuations in interest rates, foreign exchange and equities and commodities prices. The Firm makes markets in derivatives in order to meet these needs and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. The Firm also uses derivative instruments to manage its own credit risk and other market risk exposure. The nature of the counterparty and the settlement mechanism of the derivative affect the credit risk to which the Firm is exposed. For OTC derivatives the Firm is exposed to the credit risk of the derivative counterparty. For exchange-traded derivatives ("ETD"), such as futures and options, and cleared over-the-counter ("OTC-cleared") derivatives, the Firm can also be exposed to the credit risk of the relevant CCP. Where possible, the Firm seeks to mitigate its credit risk exposures arising from derivative contracts through the use of legally enforceable master netting arrangements and collateral agreements. The percentage of the Firm's OTC derivative transactions subject to collateral agreements – excluding foreign exchange spot trades, which are not typically covered by collateral agreements due to their short

maturity and centrally cleared trades that are settled daily – was approximately 88% at both December 31, 2021 and 2020. Refer to Note 5 for additional information on the Firm's use of collateral agreements. Refer to Note 5 for a further discussion of derivative contracts, counterparties and settlement types.

The fair value of derivative receivables reported on the Consolidated balance sheets were \$57.1 billion and \$75.4 billion at December 31, 2021 and 2020, respectively. The decrease was primarily driven by market movements and maturities of certain trades in CIB, partially offset by an increase in commodity derivatives. Derivative receivables represent the fair value of the derivative contracts after giving effect to legally enforceable master netting agreements and the related cash collateral held by the Firm.

In addition, the Firm held liquid securities and other cash collateral that the Firm believes is legally enforceable and may be used as security when the fair value of the client's exposure is in the Firm's favor. For these purposes, the definition of liquid securities is consistent with the definition of high quality liquid assets as defined in the LCR rule.

In management's view, the appropriate measure of current credit risk should also take into consideration other collateral, which generally represents securities that do not qualify as high quality liquid assets under the LCR rule, but that the Firm believes is legally enforceable. The collateral amounts for each counterparty are limited to the net derivative receivables for the counterparty.

The Firm also holds additional collateral (primarily cash, G7 government securities, other liquid government agency and guaranteed securities, and corporate debt and equity securities) delivered by clients at the initiation of transactions, as well as collateral related to contracts that have a non-daily call frequency and collateral that the Firm has agreed to return but has not yet settled as of the reporting date. Although this collateral does not reduce the balances and is not included in the tables below, it is available as security against potential exposure that could arise should the fair value of the client's derivative contracts move in the Firm's favor. Refer to Note 5 for additional information on the Firm's use of collateral agreements.

The following tables summarize the net derivative receivables and the internal ratings profile for the periods presented.

Derivative receivables

December 31, (in millions)	2021	2020
Total, net of cash collateral	\$ 57,081	\$ 75,444 ^(a)
Liquid securities and other cash collateral held against derivative receivables	(10,102)	(14,806)
Total, net of liquid securities and other cash collateral	\$ 46,979	\$ 60,638
Other collateral held against derivative receivables	(1,544)	(1,836) ^(a)
Total, net of collateral	\$ 45,435	\$ 58,802

(a) Prior-period amounts have been revised to conform with the current presentation.

Ratings profile of derivative receivables

December 31, (in millions, except ratios)	2021		2020	
	Exposure net of collateral	% of exposure net of collateral	Exposure net of collateral	% of exposure net of collateral
Investment-grade	\$ 30,278	67 %	\$ 37,013	63 %
Noninvestment-grade	15,157	33	21,789	37
Total	\$ 45,435	100 %	\$ 58,802	100 %

While useful as a current view of credit exposure, the net fair value of the derivative receivables does not capture the potential future variability of that credit exposure. To capture the potential future variability of credit exposure, the Firm calculates, on a client-by-client basis, three measures of potential derivatives-related credit loss: Peak, Derivative Risk Equivalent (“DRE”), and Average exposure (“AVG”). These measures all incorporate netting and collateral benefits, where applicable.

Peak represents a conservative measure of potential derivative exposure, including the benefit of collateral, to a counterparty calculated in a manner that is broadly equivalent to a 97.5% confidence level over the life of the transaction. Peak is the primary measure used by the Firm for setting credit limits for derivative contracts, senior management reporting and derivatives exposure management.

DRE exposure is a measure that expresses the risk of derivative exposure, including the benefit of collateral, on a basis intended to be equivalent to the risk of loan exposures. DRE is a less extreme measure of potential credit loss than Peak and is used as an input for aggregating derivative credit risk exposures with loans and other credit risk.

Finally, AVG is a measure of the expected fair value of the Firm’s derivative exposure, including the benefit of collateral, at future time periods. AVG over the total life of the derivative contract is used as the primary metric for pricing purposes and is used to calculate credit risk capital and CVA, as further described below.

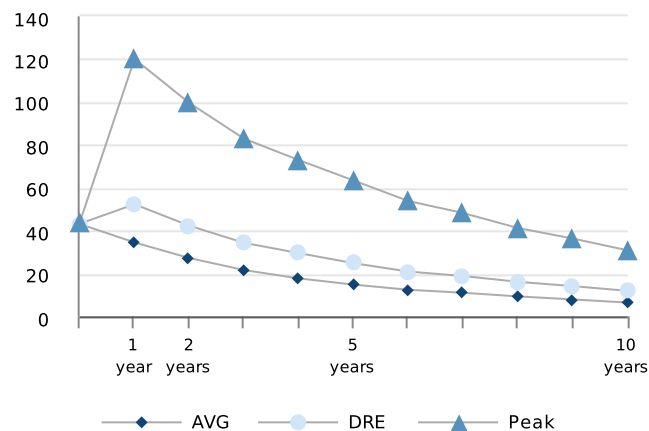
The fair value of the Firm’s derivative receivables incorporates CVA to reflect the credit quality of counterparties. CVA is based on the Firm’s AVG to a counterparty and the counterparty’s credit spread in the credit derivatives market. The Firm believes that active risk management is essential to controlling the dynamic credit risk in the derivatives portfolio. In addition, the Firm’s risk

management process for derivatives exposures takes into consideration the potential impact of wrong-way risk, which is broadly defined as the risk that exposure to a counterparty is positively correlated with the impact of a default by the same counterparty, which could cause exposure to increase at the same time as the counterparty’s capacity to meet its obligations is decreasing. Many factors may influence the nature and magnitude of these correlations over time. To the extent that these correlations are identified, the Firm may adjust the CVA associated with a particular counterparty’s AVG. The Firm risk manages exposure to changes in CVA by entering into credit derivative contracts, as well as interest rate, foreign exchange, equity and commodity derivative contracts.

The below graph shows exposure profiles to the Firm’s current derivatives portfolio over the next 10 years as calculated by the Peak, DRE and AVG metrics. The three measures generally show that exposure will decline after the first year, if no new trades are added to the portfolio.

Exposure profile of derivatives measures

December 31, 2021
(in billions)



Management's discussion and analysis

Credit derivatives

The Firm uses credit derivatives for two primary purposes: first, in its capacity as a market-maker, and second, as an end-user, to manage the Firm's own credit risk associated with various exposures.

Credit portfolio management activities

Included in the Firm's end-user activities are credit derivatives used to mitigate the credit risk associated with traditional lending activities (loans and lending-related commitments) and derivatives counterparty exposure in the Firm's wholesale businesses (collectively, "credit portfolio management activities"). Information on credit portfolio management activities is provided in the table below.

The Firm also uses credit derivatives as an end-user to manage other exposures, including credit risk arising from certain securities held in the Firm's market-making businesses. These credit derivatives are not included in credit portfolio management activities.

Credit derivatives and credit-related notes used in credit portfolio management activities

December 31, (in millions)	Notional amount of protection purchased and sold ^(a)	
	2021	2020
Credit derivatives and credit-related notes used to manage:		
Loans and lending-related commitments	\$ 4,138	\$ 4,856
Derivative receivables	16,052	18,362
Credit derivatives and credit-related notes used in credit portfolio management activities	\$ 20,190	\$ 23,218

(a) Amounts are presented net, considering the Firm's net protection purchased or sold with respect to each underlying reference entity or index. Prior-period amounts have been revised to conform with the current presentation.

The credit derivatives used in credit portfolio management activities do not qualify for hedge accounting under U.S. GAAP; these derivatives are reported at fair value, with gains and losses recognized in principal transactions revenue. In contrast, the loans and lending-related commitments being risk-managed are accounted for on an accrual basis. This asymmetry in accounting treatment, between loans and lending-related commitments and the credit derivatives used in credit portfolio management activities, causes earnings volatility that is not representative, in the Firm's view, of the true changes in value of the Firm's overall credit exposure.

The effectiveness of credit default swaps ("CDS") as a hedge against the Firm's exposures may vary depending on a number of factors, including the named reference entity (i.e., the Firm may experience losses on specific exposures that are different than the named reference entities in the purchased CDS); the contractual terms of the CDS (which may have a defined credit event that does not align with an actual loss realized by the Firm); and the maturity of the Firm's CDS protection (which in some cases may be shorter than the Firm's exposures). However, the Firm generally seeks to purchase credit protection with a maturity date that is the same or similar to the maturity date of the exposure for which the protection was purchased, and remaining differences in maturity are actively monitored and managed by the Firm. Refer to Credit derivatives in Note 5 for further information on credit derivatives and derivatives used in credit portfolio management activities.

ALLOWANCE FOR CREDIT LOSSES

The Firm's allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The Firm's allowance for credit losses comprises:

- the allowance for loan losses, which covers the Firm's retained loan portfolios (scored and risk-rated) and is presented separately on the Consolidated balance sheets,
- the allowance for lending-related commitments, which is presented on the Consolidated balance sheets in accounts payable and other liabilities, and
- the allowance for credit losses on investment securities, which is recognized within Investment Securities on the Consolidated balance sheets.

Discussion of changes in the allowance

The allowance for credit losses as of December 31, 2021 was \$18.7 billion, a decrease from \$30.8 billion at December 31, 2020. The decrease in the allowance for credit losses was primarily driven by improvements in the macroeconomic environment, consisting of:

- a \$9.5 billion reduction in consumer, predominantly in the credit card portfolio; and
- a \$2.6 billion net reduction in wholesale, across the LOBs.

The Firm's allowance for credit losses is estimated using a weighted average of five internally developed macroeconomic scenarios. As of December 31, 2021, the Firm assigned more balanced weightings to both its adverse and upside scenarios compared to the significant weighting that the Firm placed on its adverse scenarios as of December 31, 2020, reflecting the sustained improvement and resilience of the macroeconomic environment, despite the ongoing impact of the COVID-19 pandemic. In addition, because the impact of the COVID-19 pandemic and governmental actions taken in response to the pandemic caused a dislocation in certain historical relationships used for modeling credit loss estimates, the Firm continues to place reliance on management judgment and make adjustments specific to that dislocation, although to a lesser extent than in 2020. The allowance for credit losses of \$18.7 billion reflects remaining uncertainties, including the potential impact that additional waves or variants of COVID-19 may have on the pace of economic growth and near-term supply chain disruptions.

The Firm's central case assumptions reflected U.S. unemployment rates and year over year growth in U.S. real GDP as follows:

	Assumptions at December 31, 2021		
	2Q22	4Q22	2Q23
U.S. unemployment rate ^(a)	4.2 %	4.0 %	3.9 %
YoY growth in U.S. real GDP ^(b)	3.1 %	2.8 %	2.1 %

	Assumptions at December 31, 2020		
	2Q21	4Q21	2Q22
U.S. unemployment rate ^(a)	6.8 %	5.7 %	5.1 %
YoY growth in U.S. real GDP ^(b)	9.2 %	3.5 %	3.9 %

(a) Reflects quarterly average of forecasted U.S. unemployment rate.

(b) As of December 31, 2021, the year over year growth in U.S. real GDP in the forecast horizon of the central scenario is calculated as the percent change in U.S. real GDP levels from the prior year. This year over year growth rate replaces the previously disclosed pandemic-focused measure of the cumulative change in U.S. real GDP from pre-pandemic conditions at December 31, 2019. Prior periods have been revised to conform with the current presentation.

Subsequent changes to this forecast and related estimates will be reflected in the provision for credit losses in future periods.

Refer to Critical Accounting Estimates Used by the Firm on pages 150-153 for further information on the allowance for credit losses and related management judgments. Refer to Consumer Credit Portfolio on pages 110-116, Wholesale Credit Portfolio on pages 117-128 for additional information on the consumer and wholesale credit portfolios.

Management's discussion and analysis

Allowance for credit losses and related information

Year ended December 31, (in millions, except ratios)	2021				2020			
	Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
Allowance for loan losses								
Beginning balance at January 1,	\$ 3,636	\$ 17,800	\$ 6,892	\$ 28,328	\$ 2,538	\$ 5,683	\$ 4,902	\$ 13,123
Cumulative effect of a change in accounting principle ^(a)	NA	NA	NA	NA	297	5,517	(1,642)	4,172
Gross charge-offs	630	3,651	283	4,564	805	5,077	954	6,836
Gross recoveries collected	(619)	(939)	(141)	(1,699)	(631)	(791)	(155)	(1,577)
Net charge-offs	11	2,712	142	2,865	174	4,286	799	5,259
Provision for loan losses	(1,858)	(4,838)	(2,375)	(9,071)	974	10,886	4,431	16,291
Other	(2)	–	(4)	(6)	1	–	–	1
Ending balance at December 31,	\$ 1,765	\$ 10,250	\$ 4,371	\$ 16,386	\$ 3,636	\$ 17,800	\$ 6,892	\$ 28,328
Allowance for lending-related commitments								
Beginning balance at January 1,	\$ 187	\$ –	\$ 2,222	\$ 2,409	\$ 12	\$ –	\$ 1,179	\$ 1,191
Cumulative effect of a change in accounting principle ^(a)	NA	NA	NA	NA	133	–	(35)	98
Provision for lending-related commitments	(75)	–	(74)	(149)	42	–	1,079	1,121
Other	1	–	–	1	–	–	(1)	(1)
Ending balance at December 31,	\$ 113	\$ –	\$ 2,148	\$ 2,261	\$ 187	\$ –	\$ 2,222	\$ 2,409
Impairment methodology								
Asset-specific ^(b)	\$ (665)	\$ 313	\$ 263	\$ (89)	\$ (7)	\$ 633	\$ 682	\$ 1,308
Portfolio-based	2,430	9,937	4,108	16,475	3,643	17,167	6,210	27,020
Total allowance for loan losses	\$ 1,765	\$ 10,250	\$ 4,371	\$ 16,386	\$ 3,636	\$ 17,800	\$ 6,892	\$ 28,328
Impairment methodology								
Asset-specific	\$ –	\$ –	\$ 167	\$ 167	\$ –	\$ –	\$ 114	\$ 114
Portfolio-based	113	–	1,981	2,094	187	–	2,108	2,295
Total allowance for lending-related commitments	\$ 113	\$ –	\$ 2,148	\$ 2,261	\$ 187	\$ –	\$ 2,222	\$ 2,409
Total allowance for investment securities	NA	NA	NA	\$ 42	NA	NA	NA	\$ 78
Total allowance for credit losses	\$ 1,878	\$ 10,250	\$ 6,519	\$ 18,689	\$ 3,823	\$ 17,800	\$ 9,114	\$ 30,815
Memo:								
Retained loans, end of period	\$ 295,556	\$ 154,296	\$ 560,354	\$ 1,010,206	\$ 302,127	\$ 143,432	\$ 514,947	\$ 960,506
Retained loans, average	298,814	139,900	526,557	965,271	302,005	146,391	509,907	958,303
Credit ratios								
Allowance for loan losses to retained loans	0.60 %	6.64 %	0.78 %	1.62 %	1.20 %	12.41 %	1.34 %	2.95 %
Allowance for loan losses to retained nonaccrual loans ^(c)	36	NM	213	236	67	NM	208	323
Allowance for loan losses to retained nonaccrual loans excluding credit card	36	NM	213	89	67	NM	208	120
Net charge-off rates	–	1.94	0.03	0.30	0.06	2.93	0.16	0.55

(a) Represents the impact to allowance for credit losses upon the adoption of CECL on January 1, 2020. Refer to Note 1 for further information.

(b) Includes collateral dependent loans, including those considered TDRs and those for which foreclosure is deemed probable, modified PCD loans, and non-collateral dependent loans that have been modified or are reasonably expected to be modified in a TDR. Also includes risk-rated loans that have been placed on nonaccrual status for the wholesale portfolio segment. The asset-specific credit card allowance for loan losses modified or reasonably expected to be modified in a TDR is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.

(c) The Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.

Allocation of allowance for loan losses

The table below presents a breakdown of the allowance for loan losses by loan class. Refer to Note 12 for further information on loan classes.

December 31, (in millions, except ratios)	2021		2020	
	Allowance for loan losses	Percent of retained loans to total retained loans	Allowance for loan losses	Percent of retained loans to total retained loans
Residential real estate	\$ 817	22 %	\$ 2,047	23 %
Auto and other	948	7	1,589	8
Consumer, excluding credit card	1,765	29	3,636	31
Credit card	10,250	15	17,800	15
Total consumer	12,015	45	21,436	46
Secured by real estate	1,495	12	2,115	12
Commercial and industrial	1,881	14	3,643	15
Other	995	29	1,134	26
Total wholesale	4,371	55	6,892	54
Total	\$ 16,386	100 %	\$ 28,328	100 %

INVESTMENT PORTFOLIO RISK MANAGEMENT

Investment portfolio risk is the risk associated with the loss of principal or a reduction in expected returns on investments arising from the investment securities portfolio or from principal investments. The investment securities portfolio is predominantly held by Treasury and CIO in connection with the Firm's balance sheet and asset-liability management objectives. Principal investments are predominantly privately-held financial instruments and are managed in the LOBs and Corporate. Investments are typically intended to be held over extended periods and, accordingly, the Firm has no expectation for short-term realized gains with respect to these investments.

Investment securities risk

Investment securities risk includes the exposure associated with a default in the payment of principal and interest. This risk is mitigated given that the investment securities portfolio held by Treasury and CIO predominantly consists of high-quality securities. At December 31, 2021, the Treasury and CIO investment securities portfolio, net of allowance for credit losses, was \$670.1 billion, and the average credit rating of the securities comprising the portfolio was AA+ (based upon external ratings where available, and where not available, based primarily upon internal risk ratings). Refer to Corporate segment results on pages 79-80 and Note 10 for further information on the investment securities portfolio and internal risk ratings. Refer to Market Risk Management on pages 133-140 for further information on the market risk inherent in the portfolio. Refer to Liquidity Risk Management on pages 97-104 for further information on related liquidity risk.

Governance and oversight

Investment securities risks are governed by the Firm’s Risk Appetite framework, and reviewed at the CTC Risk Committee with regular updates to the Board Risk Committee.

The Firm’s independent control functions are responsible for reviewing the appropriateness of the carrying value of investment securities in accordance with relevant policies. Approved levels for investment securities are established for each risk category, including capital and credit risks.

Principal investment risk

Principal investments are typically privately-held financial instruments representing ownership interests or other forms of junior capital. In general, principal investments include tax-oriented investments and investments made to enhance or accelerate the Firm’s business strategies and exclude those that are consolidated on the Firm's balance sheets. These investments are made by dedicated investing businesses or as part of a broader business strategy. The Firm’s principal investments are managed by the LOBs and Corporate and are reflected within their respective financial results. The Firm’s investments will continue to evolve in line with its strategies, including the Firm’s commitment to support underserved communities and minority-owned businesses. The aggregate carrying values of the principal investment portfolios have not been significantly affected by the impact of the COVID-19 pandemic.

The table below presents the aggregate carrying values of the principal investment portfolios as of December 31, 2021 and 2020.

(in billions)	December 31, 2021	December 31, 2020
Tax-oriented investments, primarily in alternative energy and affordable housing ^(a)	\$ 23.2	\$ 20.0
Private equity, various debt and equity instruments, and real assets	7.3	6.2
Total carrying value	\$ 30.5	\$ 26.2

(a) Prior-period amount has been revised to conform with the current presentation. Refer to Note 25 for further information.

Governance and oversight

The Firm’s approach to managing principal risk is consistent with the Firm’s risk governance structure. A Firmwide risk policy framework exists for all principal investing activities and includes approval by executives who are independent from the investing businesses, as appropriate.

The Firm’s independent control functions are responsible for reviewing the appropriateness of the carrying value of investments in accordance with relevant policies. As part of the risk governance structure, approved levels for investments are established and monitored for each relevant business or segment in order to manage the overall size of the portfolios. The Firm also conducts stress testing on these portfolios using specific scenarios that estimate losses based on significant market moves and/or other risk events.

MARKET RISK MANAGEMENT

Market risk is the risk associated with the effect of changes in market factors such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.

Market Risk Management

Market Risk Management monitors market risks throughout the Firm and defines market risk policies and procedures.

Market Risk Management seeks to manage risk, facilitate efficient risk/return decisions, reduce volatility in operating performance and provide transparency into the Firm's market risk profile for senior management, the Board of Directors and regulators. Market Risk Management is responsible for the following functions:

- Maintaining a market risk policy framework
- Independently measuring, monitoring and controlling LOB, Corporate, and Firmwide market risk
- Defining, approving and monitoring of limits
- Performing stress testing and qualitative risk assessments

Risk measurement

Measures used to capture market risk

There is no single measure to capture market risk and therefore Market Risk Management uses various metrics, both statistical and nonstatistical, to assess risk including:

- Value-at-risk (VaR)
- Stress testing
- Profit and loss drawdowns
- Earnings-at-risk
- Other sensitivity-based measures

Risk monitoring and control

Market risk exposure is managed primarily through a series of limits set in the context of the market environment and business strategy. In setting limits, Market Risk Management takes into consideration factors such as market volatility, product liquidity, accommodation of client business, and management judgment. Market Risk Management maintains different levels of limits. Firm level limits include VaR and stress limits. Similarly, LOB and Corporate limits include VaR and stress limits and may be supplemented by certain nonstatistical risk measures such as profit and loss drawdowns. Limits may also be set within the LOBs and Corporate, as well as at the legal entity level.

Market Risk Management sets limits and regularly reviews and updates them as appropriate. Senior management is responsible for reviewing and approving certain of these risk limits on an ongoing basis. Limits that have not been reviewed within specified time periods by Market Risk Management are reported to senior management. The LOBs and Corporate are responsible for adhering to established limits against which exposures are monitored and reported.

Limit breaches are required to be reported in a timely manner to limit approvers, which include Market Risk Management and senior management. In the event of a breach, Market Risk Management consults with senior members of appropriate groups within the Firm to determine the suitable course of action required to return the applicable positions to compliance, which may include a reduction in risk in order to remedy the breach or granting a temporary increase in limits to accommodate an expected increase in client activity and/or market volatility. Certain Firm, Corporate or LOB-level limit breaches are escalated as appropriate.

Market Risk Management continues to actively monitor the impact of the COVID-19 pandemic on market risk exposures by leveraging existing risk measures and controls.

Models used to measure market risk are inherently imprecise and are limited in their ability to measure certain risks or to predict losses. This imprecision may be heightened when sudden or severe shifts in market conditions occur. For additional discussion on model uncertainty refer to Estimations and Model Risk Management on page 149.

Market Risk Management periodically reviews the Firm's existing market risk measures to identify opportunities for enhancement, and to the extent appropriate, will calibrate those measures accordingly over time.

Management’s discussion and analysis

The following table summarizes the predominant business activities and related market risks, as well as positions which give rise to market risk and certain measures used to capture those risks, for each LOB and Corporate.

In addition to the predominant business activities, each LOB and Corporate may engage in principal investing activities. To the extent principal investments are deemed market risk sensitive, they are reflected in relevant risk measures and captured in the table below. Refer to Investment Portfolio Risk Management on page 132 for additional discussion on principal investments.

LOBs and Corporate	Predominant business activities	Related market risks	Positions included in Risk Management VaR	Positions included in earnings-at-risk	Positions included in other sensitivity-based measures
CCB	<ul style="list-style-type: none"> • Originates and services mortgage loans • Originates loans and takes deposits 	<ul style="list-style-type: none"> • Risk from changes in the probability of newly originated mortgage commitments closing • Interest rate risk and prepayment risk 	<ul style="list-style-type: none"> • Mortgage commitments, classified as derivatives • Warehouse loans that are fair value option elected, classified as loans - debt instruments • MSRs • Hedges of mortgage commitments, warehouse loans and MSRs, classified as derivatives • Interest-only and mortgage-backed securities, classified as trading assets debt instruments, and related hedges, classified as derivatives • Fair value option elected liabilities^(a) 	<ul style="list-style-type: none"> • Retained loan portfolio • Deposits 	<ul style="list-style-type: none"> • Fair value option elected liabilities DVA^(a)
CIB	<ul style="list-style-type: none"> • Makes markets and services clients across fixed income, foreign exchange, equities and commodities • Originates loans and takes deposits 	<ul style="list-style-type: none"> • Risk of loss from adverse movements in market prices and implied volatilities across interest rate, foreign exchange, credit, commodity and equity instruments • Basis and correlation risk from changes in the way asset values move relative to one another • Interest rate risk and prepayment risk 	<ul style="list-style-type: none"> • Trading assets/liabilities - debt and marketable equity instruments, and derivatives, including hedges of the retained loan portfolio • Certain securities purchased, loaned or sold under resale agreements and securities borrowed • Fair value option elected liabilities^(a) • Certain fair value option elected loans • Derivative CVA and associated hedges • Marketable equity investments 	<ul style="list-style-type: none"> • Retained loan portfolio • Deposits 	<ul style="list-style-type: none"> • Privately held equity and other investments measured at fair value; and certain real estate-related fair value option elected loans • Derivatives FVA and fair value option elected liabilities DVA^(a)
CB	<ul style="list-style-type: none"> • Originates loans and takes deposits 	<ul style="list-style-type: none"> • Interest rate risk and prepayment risk 	<ul style="list-style-type: none"> • Marketable equity investments^(b) 	<ul style="list-style-type: none"> • Retained loan portfolio • Deposits 	
AWM	<ul style="list-style-type: none"> • Provides initial capital investments in products such as mutual funds and capital invested alongside third-party investors • Originates loans and takes deposits 	<ul style="list-style-type: none"> • Risk from adverse movements in market factors (e.g., market prices, rates and credit spreads) • Interest rate risk and prepayment risk 	<ul style="list-style-type: none"> • Debt securities held in advance of distribution to clients, classified as trading assets - debt instruments^(b) 	<ul style="list-style-type: none"> • Retained loan portfolio • Deposits 	<ul style="list-style-type: none"> • Initial seed capital investments and related hedges, classified as derivatives • Certain deferred compensation and related hedges, classified as derivatives • Capital invested alongside third-party investors, typically in privately distributed collective vehicles managed by AWM (i.e., co-investments)
Corporate	<ul style="list-style-type: none"> • Manages the Firm’s liquidity, funding, capital, structural interest rate and foreign exchange risks 	<ul style="list-style-type: none"> • Structural interest rate risk from the Firm’s traditional banking activities • Structural non-USD foreign exchange risks 	<ul style="list-style-type: none"> • Derivative positions measured through noninterest revenue in earnings • Marketable equity investments 	<ul style="list-style-type: none"> • Deposits with banks • Investment securities portfolio and related interest rate hedges • Long-term debt and related interest rate hedges 	<ul style="list-style-type: none"> • Privately held equity and other investments measured at fair value • Foreign exchange exposure related to Firm-issued non-USD long-term debt (“LTD”) and related hedges

(a) Reflects structured notes in Risk Management VaR and the DVA on structured notes in other sensitivity-based measures.

(b) The AWM and CB contributions to Firmwide average VaR were not material for the years ended December 31, 2021 and 2020.

Value-at-risk

JPMorgan Chase utilizes value-at-risk (“VaR”), a statistical risk measure, to estimate the potential loss from adverse market moves in the current market environment. The Firm has a single VaR framework used as a basis for calculating Risk Management VaR and Regulatory VaR.

The framework is employed across the Firm using historical simulation based on data for the previous 12 months. The framework’s approach assumes that historical changes in market values are representative of the distribution of potential outcomes in the immediate future. The Firm believes the use of Risk Management VaR provides a daily measure of risk that is closely aligned to risk management decisions made by the LOBs and Corporate and, along with other market risk measures, provides the appropriate information needed to respond to risk events.

The Firm’s Risk Management VaR is calculated assuming a one-day holding period and an expected tail-loss methodology which approximates a 95% confidence level. Risk Management VaR provides a consistent framework to measure risk profiles and levels of diversification across product types and is used for aggregating risks and monitoring limits across businesses. VaR results are reported to senior management, the Board of Directors and regulators.

Underlying the overall VaR model framework are individual VaR models that simulate historical market returns for individual risk factors and/or product types. To capture material market risks as part of the Firm’s risk management framework, comprehensive VaR model calculations are performed daily for businesses whose activities give rise to market risk. These VaR models are granular and incorporate numerous risk factors and inputs to simulate daily changes in market values over the historical period; inputs are selected based on the risk profile of each portfolio, as sensitivities and historical time series used to generate daily market values may be different across product types or risk management systems. The VaR model results across all portfolios are aggregated at the Firm level.

As VaR is based on historical data, it is an imperfect measure of market risk exposure and potential future losses. In addition, based on their reliance on available historical data, limited time horizons, and other factors, VaR measures are inherently limited in their ability to measure certain risks and to predict losses, particularly those associated with market illiquidity and sudden or severe shifts in market conditions.

For certain products, specific risk parameters are not captured in VaR due to the lack of liquidity and availability of appropriate historical data. The Firm uses proxies to estimate the VaR for these and other products when daily time series are not available. It is likely that using an actual price-based time series for these products, if available, would affect the VaR results presented. The Firm therefore considers other nonstatistical measures such as stress

testing, in addition to VaR, to capture and manage its market risk positions.

The daily market data used in VaR models may be different than the independent third-party data collected for VCG price testing in its monthly valuation process. For example, in cases where market prices are not observable, or where proxies are used in VaR historical time series, the data sources may differ. Refer to Valuation process in Note 2 for further information on the Firm’s valuation process. As VaR model calculations require daily data and a consistent source for valuation, it may not be practical to use the data collected in the VCG monthly valuation process for VaR model calculations.

The Firm’s VaR model calculations are periodically evaluated and enhanced in response to changes in the composition of the Firm’s portfolios, changes in market conditions, improvements in the Firm’s modeling techniques and measurements, and other factors. Such changes may affect historical comparisons of VaR results. Refer to Estimations and Model Risk Management on page 149 for information regarding model reviews and approvals.

The Firm calculates separately a daily aggregated VaR in accordance with regulatory rules (“Regulatory VaR”), which is used to derive the Firm’s regulatory VaR-based capital requirements under Basel III capital rules. This Regulatory VaR model framework currently assumes a ten business-day holding period and an expected tail loss methodology which approximates a 99% confidence level. Regulatory VaR is applied to “covered” positions as defined by Basel III capital rules, which may be different than the positions included in the Firm’s Risk Management VaR. For example, credit derivative hedges of accrual loans are included in the Firm’s Risk Management VaR, while Regulatory VaR excludes these credit derivative hedges. In addition, in contrast to the Firm’s Risk Management VaR, Regulatory VaR currently excludes the diversification benefit for certain VaR models.

Refer to JPMorgan Chase’s Basel III Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm’s website, for additional information on Regulatory VaR and the other components of market risk regulatory capital for the Firm (e.g., VaR-based measure, stressed VaR-based measure and the respective backtesting).

Management's discussion and analysis

The table below shows the results of the Firm's Risk Management VaR measure using a 95% confidence level. VaR can vary significantly as positions change, market volatility fluctuates, and diversification benefits change.

Total VaR

As of or for the year ended December 31, (in millions)	2021			2020		
	Avg.	Min	Max	Avg.	Min	Max
CIB trading VaR by risk type						
Fixed income	\$ 60	\$ 30	\$ 153	\$ 98	\$ 35	\$ 156
Foreign exchange	6	2	27	10	4	18
Equities	16	8	38	24	13	41
Commodities and other	19	9	43	28	7	47
Diversification benefit to CIB trading VaR	(49) ^(a)	NM ^(c)	NM ^(c)	(67) ^(a)	NM ^(c)	NM ^(c)
CIB trading VaR	52	22	134	93	32	160
Credit portfolio VaR	6	4	12	16	3	28
Diversification benefit to CIB VaR	(6) ^(a)	NM ^(c)	NM ^(c)	(17) ^(a)	NM ^(c)	NM ^(c)
CIB VaR	52	22	133	92	31	162
CCB VaR	5	3	11	5	1	12
Corporate and other LOB VaR	24 ^(b)	14	94 ^(b)	19 ^(b)	9	82 ^(b)
Diversification benefit to other VaR	(4) ^(a)	NM ^(c)	NM ^(c)	(4) ^(a)	NM ^(c)	NM ^(c)
Other VaR	25	14	94	20	10	82
Diversification benefit to CIB and other VaR	(22) ^(a)	NM ^(c)	NM ^(c)	(17) ^(a)	NM ^(c)	NM ^(c)
Total VaR	\$ 55	\$ 24	\$ 153	\$ 95	\$ 32	\$ 164

(a) Diversification benefit represents the difference between the portfolio VaR and the sum of its individual components. This reflects the non-additive nature of VaR due to imperfect correlation across LOBs, Corporate, and risk types.

(b) Average and maximum Corporate and other LOB VaR were primarily driven by a private equity position that became publicly traded at the end of the third quarter of 2020. As of March 31, 2021 the Firm no longer held this position.

(c) The maximum and minimum VaR for each portfolio may have occurred on different trading days than the components and consequently diversification benefit is not meaningful.

Generally, average VaR across risk types and LOBs was lower due to volatility which occurred at the onset of the COVID-19 pandemic rolling out of the one-year historical look-back period, predominantly impacting exposures in fixed income and commodities. As a result, average Total VaR decreased by \$40 million for the year ended December 31, 2021 when compared with the prior year.

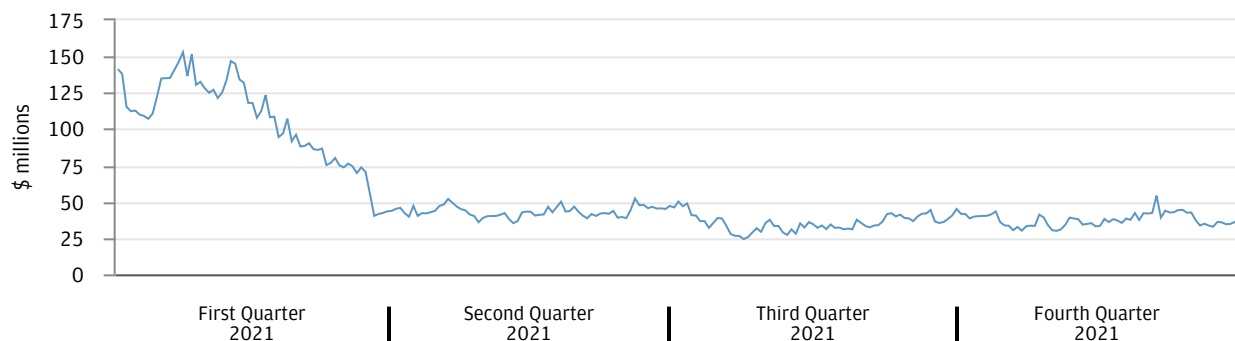
In the current year, maximum VaR remained elevated relative to average VaR as the aforementioned volatility was still included in the historical look-back period in the first quarter of 2021.

Effective July 1, 2020, the Firm refined the scope of VaR to exclude certain real estate-related fair value option elected loans, and included them in other sensitivity-based measures to more effectively measure the risk from these loans. In the absence of this refinement, the average Total VaR and each of the components would have been higher by the amounts reported in the following table:

For the year ended December 31, (in millions)	Amount by which reported average VaR would have been higher	
	2021	2020
CIB fixed income VaR	\$ 5	\$ 11
CIB trading VaR	5	9
CIB VaR	5	9
Total VaR	4	9

The following graph presents daily Risk Management VaR for the four trailing quarters. As noted previously, average Total VaR decreased by \$40 million for the year ended December 31, 2021, when compared with the prior year. Daily Risk Management VaR has also declined, returning to pre-pandemic levels, as the volatility which occurred in late March of 2020 at the onset of the COVID-19 pandemic has rolled out of the one-year historical look-back period.

Daily Risk Management VaR



VaR backtesting

The Firm performs daily VaR model backtesting, which compares the daily Risk Management VaR results with the daily gains and losses that are utilized for VaR backtesting purposes. The gains and losses depicted in the chart below do not reflect the Firm’s reported revenue as they exclude select components of total net revenue, such as those associated with the execution of new transactions (i.e., intraday client-driven trading and intraday risk management activities), fees, commissions, certain valuation adjustments and net interest income. These excluded components of total net revenue may more than offset the backtesting gain or loss on a particular day. The definition of backtesting gains and losses above is consistent with the requirements for backtesting under Basel III capital rules.

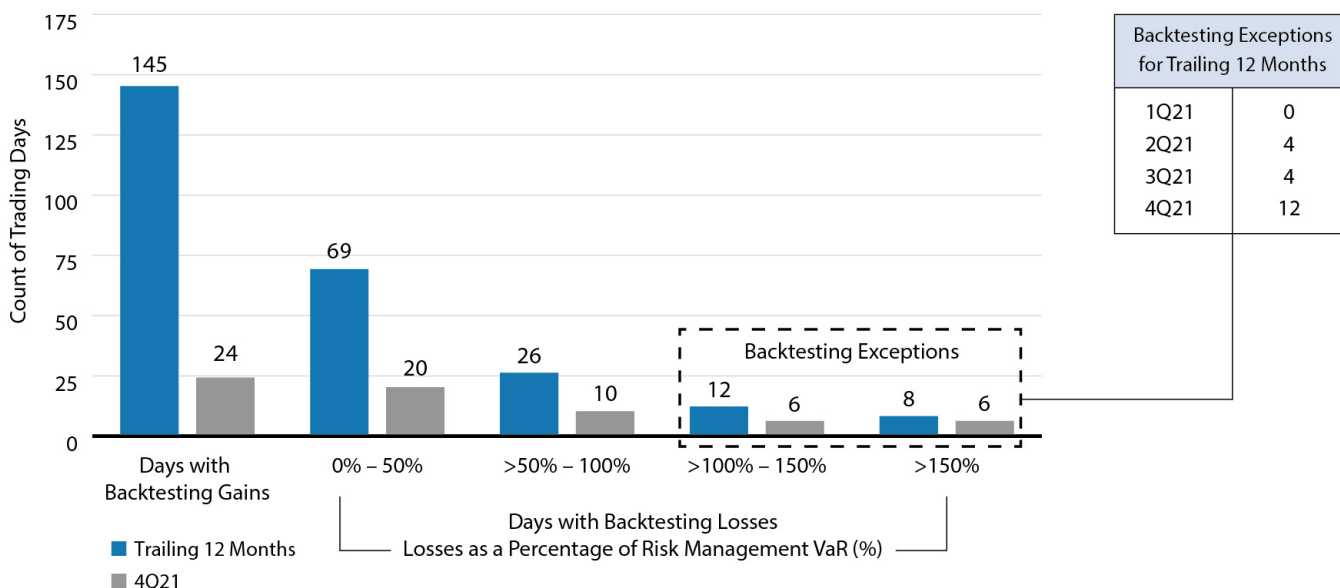
A backtesting exception occurs when the daily backtesting loss exceeds the daily Risk Management VaR for the prior day. Under the Firm’s Risk Management VaR methodology, assuming current changes in market values are consistent with the historical changes used in the simulation, the Firm would expect to incur VaR backtesting exceptions on

average five times every 100 trading days. The number of VaR backtesting exceptions observed can differ from the statistically expected number of backtesting exceptions if the current level of market volatility is materially different from the level of market volatility during the 12 months of historical data used in the VaR calculation.

For the 12 months ended December 31, 2021, the Firm posted backtesting gains on 145 of the 260 days, and observed 20 VaR backtesting exceptions. Twelve of the backtesting exceptions were in the three months ended December 31, 2021 as market volatility, particularly related to interest rates, was materially higher than the market volatility in the 12 months of historical data used for the VaR calculation. Firmwide backtesting loss days can differ from the loss days for which Fixed Income Markets and Equity Markets posted losses, as disclosed in CIB Markets revenue, as the population of positions which compose each metric are different and due to the exclusion of select components of total net revenue in backtesting gains and losses as described above. For more information on CIB Markets revenue, refer to pages 70-71.

The following chart presents the distribution of Firmwide daily backtesting gains and losses for the trailing 12 months and three months ended December 31, 2021. The daily backtesting losses are displayed as a percentage of the corresponding daily Risk Management VaR. The count of days with backtesting losses are shown in aggregate, in fifty percentage point intervals. Backtesting exceptions are displayed within the intervals that are greater than one hundred percent. The results in the chart below differ from the results of backtesting disclosed in the Market Risk section of the Firm’s Basel III Pillar 3 Regulatory Capital Disclosures reports, which are based on Regulatory VaR applied to the Firm’s covered positions.

Distribution of Daily Backtesting Gains and Losses



Management's discussion and analysis

Other risk measures

Stress testing

Along with VaR, stress testing is an important tool used to assess risk. While VaR reflects the risk of loss due to adverse changes in markets using recent historical market behavior, stress testing reflects the risk of loss from hypothetical changes in the value of market risk sensitive positions applied simultaneously. Stress testing measures the Firm's vulnerability to losses under a range of stressed but possible economic and market scenarios. The results are used to understand the exposures responsible for those potential losses and are measured against limits.

The Firm's stress framework covers market risk sensitive positions in the LOBs and Corporate. The framework is used to calculate multiple magnitudes of potential stress for both market rallies and market sell-offs, assuming significant changes in market factors such as credit spreads, equity prices, interest rates, currency rates and commodity prices, and combines them in multiple ways to capture an array of hypothetical economic and market scenarios.

The Firm generates a number of scenarios that focus on tail events in specific asset classes and geographies, including how the event may impact multiple market factors simultaneously. Scenarios also incorporate specific idiosyncratic risks and stress basis risk between different products. The flexibility in the stress framework allows the Firm to construct new scenarios that can test the outcomes against possible future stress events. Stress testing results are reported periodically to senior management of the Firm, as appropriate.

Stress scenarios are governed by the overall stress framework, under the oversight of Market Risk Management, and the models to calculate the stress results are subject to the Firm's Estimations and Model Risk Management Policy. The Firmwide Market Risk Stress Methodology Committee reviews and approves changes to stress testing methodology and scenarios across the Firm. Significant changes to the framework are escalated to senior management, as appropriate.

The Firm's stress testing framework is utilized in calculating the Firm's CCAR and other stress test results, which are reported periodically to the Board of Directors. In addition, stress testing results are incorporated into the Firm's Risk Appetite framework, and are reported periodically to the Board Risk Committee.

Profit and loss drawdowns

Profit and loss drawdowns are used to highlight trading losses above certain levels of risk tolerance. A profit and loss drawdown is a decline in revenue from its year-to-date peak level.

Earnings-at-risk

The effect of interest rate exposure on the Firm's reported net income is important as interest rate risk represents one of the Firm's significant market risks. Interest rate risk arises not only from trading activities but also from the

Firm's traditional banking activities, which include extension of loans and credit facilities, taking deposits, issuing debt and the investment securities portfolio. Refer to the table on page 134 for a summary by LOB and Corporate, identifying positions included in earnings-at-risk.

The CTC Risk Committee establishes the Firm's structural interest rate risk policy and related limits, which are subject to approval by the Board Risk Committee. Treasury and CIO, working in partnership with the LOBs, calculates the Firm's structural interest rate risk profile and reviews it with senior management, including the CTC Risk Committee. In addition, oversight of structural interest rate risk is managed through a dedicated risk function reporting to the CTC CRO. This risk function is responsible for providing independent oversight and governance around assumptions and establishing and monitoring limits for structural interest rate risk. The Firm manages structural interest rate risk generally through its investment securities portfolio and interest rate derivatives.

Structural interest rate risk can occur due to a variety of factors, including:

- Differences in timing among the maturity or repricing of assets, liabilities and off-balance sheet instruments
- Differences in the amounts of assets, liabilities and off-balance sheet instruments that are maturing or repricing at the same time
- Differences in the amounts by which short-term and long-term market interest rates change (for example, changes in the slope of the yield curve)
- The impact of changes in the maturity of various assets, liabilities or off-balance sheet instruments as interest rates change

The Firm manages interest rate exposure related to its assets and liabilities on a consolidated, Firmwide basis. Business units transfer their interest rate risk to Treasury and CIO through funds transfer pricing, which takes into account the elements of interest rate exposure that can be risk-managed in financial markets. These elements include asset and liability balances and contractual rates of interest, contractual principal payment schedules, expected prepayment experience, interest rate reset dates and maturities, rate indices used for repricing, and any interest rate ceilings or floors for adjustable rate products.

One way the Firm evaluates its structural interest rate risk is through earnings-at-risk. Earnings-at-risk estimates the Firm's interest rate exposure for a given interest rate scenario. It is presented as a sensitivity to a baseline, which includes net interest income and certain interest rate sensitive fees. The baseline uses market interest rates and in the case of deposits, pricing assumptions. The Firm conducts simulations of changes to this baseline for interest rate-sensitive assets and liabilities denominated in U.S. dollars and other currencies ("non-U.S. dollar" currencies). These simulations primarily include retained loans, deposits, deposits with banks, investment securities, long-

term debt and any related interest rate hedges, and funds transfer pricing of other positions in risk management VaR and other sensitivity-based measures as described on page 134.

Earnings-at-risk scenarios estimate the potential change to a net interest income baseline, over the following 12 months utilizing multiple assumptions. These scenarios include a parallel shift involving changes to both short-term and long-term rates by an equal amount; a steeper yield curve involving holding short-term rates constant and increasing long-term rates; and a flatter yield curve involving increasing short-term rates and holding long-term rates constant. These scenarios consider many different factors, including:

- The impact on exposures as a result of instantaneous changes in interest rates from baseline rates.
- Forecasted balance sheet, as well as modeled prepayment and reinvestment behavior, but exclude assumptions about actions that could be taken by the Firm or its clients and customers in response to any such instantaneous rate changes. Mortgage prepayment assumptions are based on the interest rates used in the scenarios compared with underlying contractual rates, the time since origination, and other factors which are updated periodically based on historical experience. Deposit forecasts used in the baseline and scenarios do not include assumptions to account for the reversal of Quantitative Easing.
- The pricing sensitivity of deposits, known as deposit betas, represent the amount by which deposit rates paid could change upon a given change in market interest rates. The deposit rates paid in these scenarios differ from actual deposit rates paid, due to repricing lags and other factors.

The Firm's earnings-at-risk scenarios are periodically evaluated and enhanced in response to changes in the composition of the Firm's balance sheet, changes in market conditions, improvements in the Firm's simulation and other factors. While a relevant measure of the Firm's interest rate exposure, the earnings-at-risk analysis does not represent a forecast of the Firm's net interest income (Refer to Outlook on page 49 for additional information).

The Firm's U.S. dollar sensitivities are presented in the table below.

December 31, (in billions)	2021	2020
Parallel shift:		
+100 bps shift in rates	\$ 5.0	\$ 6.9
Steeper yield curve:		
+100 bps shift in long-term rates	1.8	2.4
Flatter yield curve:		
+100 bps shift in short-term rates	3.2	4.5

The change in the Firm's U.S. dollar sensitivities as of December 31, 2021 compared to December 31, 2020 reflected updates to the Firm's baseline for higher rates as well as the impact of changes in the Firm's balance sheet.

The Firm's sensitivity to rates is primarily a result of assets repricing at a faster pace than deposits.

The Firm's non-U.S. dollar sensitivities are presented in the table below.

December 31, (in billions)	2021	2020
Parallel shift:		
+100 bps shift in rates	\$ 0.8	\$ 0.9
Flatter yield curve:		
+100 bps shift in short-term rates	0.8	0.8

The results of the non-U.S. dollar interest rate scenario involving a steeper yield curve with long-term rates rising by 100 basis points and short-term rates staying at current levels were not material to the Firm's earnings-at-risk at December 31, 2021 and 2020.

Management's discussion and analysis

Non-U.S. dollar foreign exchange risk

Non-U.S. dollar FX risk is the risk that changes in foreign exchange rates affect the value of the Firm's assets or liabilities or future results. The Firm has structural non-U.S. dollar FX exposures arising from capital investments, forecasted expense and revenue, the investment securities portfolio and non-U.S. dollar-denominated debt issuance. Treasury and CIO, working in partnership with the LOBs, primarily manage these risks on behalf of the Firm. Treasury and CIO may hedge certain of these risks using derivatives.

Other sensitivity-based measures

The Firm quantifies the market risk of certain debt and equity and funding activities by assessing the potential impact on net revenue, other comprehensive income ("OCI") and noninterest expense due to changes in relevant market variables. Refer to the predominant business activities that give rise to market risk on page 134 for additional information on the positions captured in other sensitivity-based measures.

The table below represents the potential impact to net revenue, OCI or noninterest expense for market risk sensitive instruments that are not included in VaR or earnings-at-risk. Where appropriate, instruments used for hedging purposes are reported net of the positions being hedged. The sensitivities disclosed in the table below may not be representative of the actual gain or loss that would have been realized at December 31, 2021 and 2020, as the movement in market parameters across maturities may vary and are not intended to imply management's expectation of future changes in these sensitivities.

Year ended December 31, Gain/(loss) (in millions)				
Activity	Description	Sensitivity measure	2021	2020
Debt and equity^(a)				
Asset Management activities	Consists of seed capital and related hedges; fund co-investments ^(c) ; and certain deferred compensation and related hedges ^(d)	10% decline in market value	\$ (69)	\$ (48)
Other debt and equity	Consists of certain real estate-related fair value option elected loans, privately held equity and other investments held at fair value ^(c)	10% decline in market value	(971)	(919)
Funding activities				
Non-USD LTD cross-currency basis	Represents the basis risk on derivatives used to hedge the foreign exchange risk on the non-USD LTD ^(b)	1 basis point parallel tightening of cross currency basis	(16)	(16)
Non-USD LTD hedges foreign currency ("FX") exposure	Primarily represents the foreign exchange revaluation on the fair value of the derivative hedges ^(e)	10% depreciation of currency	15	13
Derivatives - funding spread risk ^(b)	Impact of changes in the spread related to derivatives FVA ^(c)	1 basis point parallel increase in spread	(7)	(9)
Fair value option elected liabilities - funding spread risk ^(b)	Impact of changes in the spread related to fair value option elected liabilities DVA ^(b)	1 basis point parallel increase in spread	41	40
Fair value option elected liabilities - interest rate sensitivity	Interest rate sensitivity on fair value option elected liabilities resulting from a change in the Firm's own credit spread ^(e)	1 basis point parallel increase in spread	(3)	(3)
	Interest rate sensitivity related to risk management of changes in the Firm's own credit spread on the fair value option elected liabilities noted above ^(c)	1 basis point parallel increase in spread	3	3

(a) Excludes equity securities without readily determinable fair values that are measured under the measurement alternative. Refer to Note 2 for additional information.

(b) Effective September 30, 2021, the Firm's funding spread risk measure for both derivatives and fair value option elected liabilities represents the sensitivity to the Firm's FVA spread. Previously, these measures represented the sensitivity to the Firm's credit spread observed in the market. The Firm believes the updated measure is more reflective of the Firm's funding spread risk. Prior-period amounts have been revised to conform with the current presentation.

(c) Impact recognized through net revenue.

(d) Impact recognized through noninterest expense.

(e) Impact recognized through OCI.

COUNTRY RISK MANAGEMENT

The Firm, through its LOBs and Corporate, may be exposed to country risk resulting from financial, economic, political or other significant developments which adversely affect the value of the Firm's exposures related to a particular country or set of countries. The Country Risk Management group actively monitors the various portfolios which may be impacted by these developments and measures the extent to which the Firm's exposures are diversified given the Firm's strategy and risk tolerance relative to a country.

Organization and management

Country Risk Management is an independent risk management function that assesses, manages and monitors exposure to country risk across the Firm.

The Firm's country risk management function includes the following activities:

- Maintaining policies, procedures and standards consistent with a comprehensive country risk framework
- Assigning sovereign ratings, assessing country risks and establishing risk tolerance relative to a country
- Measuring and monitoring country risk exposure and stress across the Firm
- Managing and approving country limits and reporting trends and limit breaches to senior management
- Developing surveillance tools, such as signaling models and ratings indicators, for early identification of potential country risk concerns
- Providing country risk scenario analysis

Sources and measurement

The Firm is exposed to country risk through its lending and deposits, investing, and market-making activities, whether cross-border or locally funded. Country exposure includes activity with both government and private-sector entities in a country.

Under the Firm's internal country risk management approach, attribution of exposure to an individual country is based on the country where the largest proportion of the assets of the counterparty, issuer, obligor or guarantor are located or where the largest proportion of its revenue is derived, which may be different than the domicile (i.e. legal residence) or country of incorporation.

Individual country exposures reflect an aggregation of the Firm's risk to an immediate default, with zero recovery, of the counterparties, issuers, obligors or guarantors attributed to that country. Activities which result in contingent or indirect exposure to a country are not included in the country exposure measure (for example, providing clearing services or secondary exposure to collateral on securities financing receivables).

Assumptions are sometimes required in determining the measurement and allocation of country exposure, particularly in the case of certain non-linear or index products, or where the nature of the counterparty, issuer, obligor or guarantor is not suitable for attribution to an

individual country. The use of different measurement approaches or assumptions could affect the amount of reported country exposure.

Under the Firm's internal country risk measurement framework:

- Lending exposures are measured at the total committed amount (funded and unfunded), net of the allowance for credit losses and eligible cash and marketable securities collateral received
- Deposits are measured as the cash balances placed with central and commercial banks
- Securities financing exposures are measured at their receivable balance, net of eligible collateral received
- Debt and equity securities are measured at the fair value of all positions, including both long and short positions
- Counterparty exposure on derivative receivables is measured at the derivative's fair value, net of the fair value of the eligible collateral received
- Credit derivatives protection purchased and sold is reported based on the underlying reference entity and is measured at the notional amount of protection purchased or sold, net of the fair value of the recognized derivative receivable or payable. Credit derivatives protection purchased and sold in the Firm's market-making activities is measured on a net basis, as such activities often result in selling and purchasing protection related to the same underlying reference entity; this reflects the manner in which the Firm manages these exposures

The Firm's internal country risk reporting differs from the reporting provided under the FFIEC bank regulatory requirements.

Management's discussion and analysis

Stress testing

Stress testing is an important component of the Firm's country risk management framework, which aims to estimate and limit losses arising from a country crisis by measuring the impact of adverse asset price movements to a country based on market shocks combined with counterparty specific assumptions. Country Risk Management periodically designs and runs tailored stress scenarios to test vulnerabilities to individual countries or sets of countries in response to specific or potential market events, sector performance concerns, sovereign actions and geopolitical risks. These tailored stress results are used to inform potential risk reduction across the Firm, as necessary.

COVID-19 Pandemic

Country Risk Management continues to monitor the impact of the COVID-19 pandemic on individual countries.

Risk reporting

Country exposure and stress are measured and reported regularly, and used by Country Risk Management to identify trends, and monitor high usages and breaches against limits.

For country risk management purposes, the Firm may report exposure to jurisdictions that are not fully autonomous, including Special Administrative Regions ("SAR") and dependent territories, separately from the independent sovereign states with which they are associated.

The following table presents the Firm's top 20 exposures by country (excluding the U.S.) as of December 31, 2021, and their comparative exposures as of December 31, 2020. The selection of countries represents the Firm's largest total exposures by individual country, based on the Firm's internal country risk management approach, and does not represent the Firm's view of any existing or potentially adverse credit conditions. Country exposures may fluctuate from period to period due to client activity and market flows.

The decrease in exposure to Germany and the increase in exposure to the United Kingdom were primarily due to changes in cash placements with the central banks of those countries driven by balance sheet and liquidity management activities in the fourth quarter of 2021.

The increase in exposure to Australia was due to increased cash placements with the central bank of Australia, largely driven by client activity following monetary policy decisions in the country and growth in client deposits.

Top 20 country exposures (excluding the U.S.)^(a)

December 31, (in billions)	2021			2020 ^(e)	
	Lending and deposits ^(b)	Trading and investing ^(c)	Other ^(d)	Total exposure	Total exposure
United Kingdom	\$ 81.7	\$ 12.7	\$ 2.0	\$ 96.4	\$ 68.4
Germany	65.3	(4.2)	0.6	61.7	127.2
Japan	38.8	6.4	0.3	45.5	45.6
Australia	29.2	9.9	—	39.1	15.9
Switzerland	14.7	1.4	4.8	20.9	18.7
China	10.1	7.1	1.4	18.6	21.2
Canada	14.7	2.0	0.2	16.9	14.5
India	5.8	7.1	1.8	14.7	10.5
France	11.0	2.0	1.0	14.0	18.8
Singapore	6.8	4.6	0.9	12.3	8.7
Brazil	5.3	6.7	—	12.0	10.8
Luxembourg	10.1	1.4	—	11.5	12.4
Spain	9.2	0.9	—	10.1	5.8
Saudi Arabia	6.9	2.2	—	9.1	5.8
South Korea	3.9	4.5	0.3	8.7	10.1
Italy	6.2	1.8	0.4	8.4	9.7
Netherlands	5.5	0.7	0.6	6.8	7.7
Belgium	5.0	1.8	—	6.8	4.0
Hong Kong SAR	3.6	2.0	0.3	5.9	6.2
Mexico	4.3	0.6	—	4.9	4.9

- (a) Country exposures presented in the table reflect 89% and 90% of total Firmwide non-U.S. exposure, where exposure is attributed to an individual country, at December 31, 2021 and 2020, respectively.
- (b) Lending and deposits includes loans and accrued interest receivable, lending-related commitments (net of eligible collateral and the allowance for credit losses), deposits with banks (including central banks), acceptances, other monetary assets, and issued letters of credit net of risk participations. Excludes intra-day and operating exposures, such as those from settlement and clearing activities.
- (c) Includes market-making inventory, investment securities, and counterparty exposure on derivative and securities financings net of eligible collateral and hedging. Includes exposure from single reference entity ("single-name"), index and other multiple reference entity transactions for which one or more of the underlying reference entities is in a country listed in the above table.
- (d) Predominantly includes physical commodity inventory.
- (e) The country rankings presented in the table as of December 31, 2020, are based on the country rankings of the corresponding exposures at December 31, 2021, not actual rankings of such exposures at December 31, 2020.

OPERATIONAL RISK MANAGEMENT

Operational risk is the risk of an adverse outcome resulting from inadequate or failed internal processes or systems; human factors; or external events impacting the Firm's processes or systems. Operational Risk includes compliance, conduct, legal, and estimations and model risk. Operational risk is inherent in the Firm's activities and can manifest itself in various ways, including fraudulent acts, business disruptions (including those caused by extraordinary events beyond the Firm's control) cyber attacks, inappropriate employee behavior, failure to comply with applicable laws, rules and regulations or failure of vendors or other third party providers to perform in accordance with their agreements. Operational Risk Management attempts to manage operational risk at appropriate levels in light of the Firm's financial position, the characteristics of its businesses, and the markets and regulatory environments in which it operates.

Operational Risk Management Framework

The Firm's Compliance, Conduct, and Operational Risk ("CCOR") Management Framework is designed to enable the Firm to govern, identify, measure, monitor and test, manage and report on the Firm's operational risk.

Operational Risk Governance

The LOBs and Corporate are responsible for the management of operational risk. The Control Management Organization, which consists of control managers within each LOB and Corporate, is responsible for the day-to-day execution of the CCOR Framework and the evaluation of the effectiveness of their control environments to determine where targeted remediation efforts may be required.

The Firm's Global Chief Compliance Officer ("CCO") and FRE for Operational Risk and Qualitative Risk Appetite is responsible for defining the CCOR Management Framework and establishing minimum standards for its execution. The LOB and Corporate aligned CCOR Lead Officers report to the Global CCO and FRE for Operational Risk and Qualitative Risk Appetite and are independent of the respective businesses or functions they oversee. The CCOR Management Framework is included in the Risk Governance and Oversight Policy that is reviewed and approved by the Board Risk Committee periodically.

Operational Risk Identification

The Firm utilizes a structured risk and control self-assessment process that is executed by the LOBs and Corporate. As part of this process, the LOBs and Corporate evaluate the effectiveness of their control environment to assess where controls have failed, and to determine where remediation efforts may be required. The Firm's Operational Risk and Compliance organization ("Operational Risk and Compliance") provides oversight of and challenge to these evaluations and may also perform independent assessments of significant operational risk events and areas of concentrated or emerging risk.

Operational Risk Measurement

Operational Risk and Compliance performs an independent assessment of the operational risks inherent within the LOBs and Corporate, which includes evaluating the effectiveness of the control environments and reporting the results to senior management.

In addition, Operational Risk and Compliance assesses operational risks through quantitative means, including operational risk-based capital and estimation of operational risk losses under both baseline and stressed conditions.

The primary component of the operational risk capital estimate is the Loss Distribution Approach ("LDA") statistical model, which simulates the frequency and severity of future operational risk loss projections based on historical data. The LDA model is used to estimate an aggregate operational risk loss over a one-year time horizon, at a 99.9% confidence level. The LDA model incorporates actual internal operational risk losses in the quarter following the period in which those losses were realized, and the calculation generally continues to reflect such losses even after the issues or business activities giving rise to the losses have been remediated or reduced.

As required under the Basel III capital framework, the Firm's operational risk-based capital methodology, which uses the Advanced Measurement Approach ("AMA"), incorporates internal and external losses as well as management's view of tail risk captured through operational risk scenario analysis, and evaluation of key business environment and internal control metrics. The Firm does not reflect the impact of insurance in its AMA estimate of operational risk capital.

The Firm considers the impact of stressed economic conditions on operational risk losses and develops a forward looking view of material operational risk events that may occur in a stressed environment. The Firm's operational risk stress testing framework is utilized in calculating results for the Firm's CCAR and other stress testing processes.

Refer to Capital Risk Management on pages 86-96 for information related to operational risk RWA, and CCAR.

Operational Risk Monitoring and testing

The results of risk assessments performed by Operational Risk and Compliance are leveraged as one of the key criteria in the independent monitoring and testing of the LOBs and Corporate's compliance with laws, rules and regulation. Through monitoring and testing, Operational Risk and Compliance independently identify areas of heightened operational risk and tests the effectiveness of controls within the LOBs and Corporate.

Management's discussion and analysis

Management of Operational Risk

The operational risk areas or issues identified through monitoring and testing are escalated to the LOBs and Corporate to be remediated through action plans, as needed, to mitigate operational risk. Operational Risk and Compliance may advise the LOBs and Corporate in the development and implementation of action plans.

Operational Risk Reporting

Escalation of risks is a fundamental expectation for employees at the Firm. Risks identified by Operational Risk and Compliance are escalated to the appropriate LOB and Corporate Control Committees, as needed. Operational Risk and Compliance has established standards to ensure that consistent operational risk reporting and operational risk reports are produced on a Firmwide basis as well as by the LOBs and Corporate. Reporting includes the evaluation of key risk and performance indicators against established thresholds as well as the assessment of different types of operational risk against stated risk appetite. The standards reinforce escalation protocols to senior management and to the Board of Directors.

Subcategories and examples of operational risks

Operational risk can manifest itself in various ways. Operational risk subcategories such as Compliance risk, Conduct risk, Legal risk, and Estimations and Model risk as well as other operational risks, can lead to losses which are captured through the Firm's operational risk measurement processes. Refer to pages 146, 147, 148 and 149, respectively for more information on Compliance, Conduct, Legal, and Estimations and Model risk. Details on other select examples of operational risks are provided below.

Cybersecurity risk

Cybersecurity risk is the risk of the Firm's exposure to harm or loss resulting from misuse or abuse of technology by malicious actors. Cybersecurity risk is an important and continuously evolving focus for the Firm. Significant resources are devoted to protecting and enhancing the security of computer systems, software, networks, storage devices, and other technology assets. The Firm's security efforts are designed to protect against, among other things, cybersecurity attacks by unauthorized parties attempting to obtain access to confidential information, destroy data, disrupt or degrade service, sabotage systems or cause other damage.

Ongoing business expansions may expose the Firm to potential new threats as well as expanded regulatory scrutiny including the introduction of new cybersecurity requirements. The Firm continues to make significant investments in enhancing its cyber defense capabilities and to strengthen its partnerships with the appropriate government and law enforcement agencies and other businesses in order to understand the full spectrum of cybersecurity risks in the operating environment, enhance defenses and improve resiliency against cybersecurity threats. The Firm actively participates in discussions and simulations of cybersecurity risks both internally and with

law enforcement, government officials, peer and industry groups, and has significantly increased efforts to educate employees and certain clients on the topic of cybersecurity risks.

Third parties with which the Firm does business or that facilitate the Firm's business activities (e.g., vendors, supply chain, exchanges, clearing houses, central depositories, and financial intermediaries) are also sources of cybersecurity risk to the Firm. Third party cybersecurity incidents such as system breakdowns or failures, misconduct by the employees of such parties, or cyberattacks, including ransomware and supply-chain compromises could affect their ability to deliver a product or service to the Firm or result in lost or compromised information of the Firm or its clients. Clients are also sources of cybersecurity risk to the Firm and its information assets, particularly when their activities and systems are beyond the Firm's own security and control systems. As a result, the Firm engages in regular and ongoing discussions with certain vendors and clients regarding cybersecurity risks and opportunities to improve security. However, where cybersecurity incidents occur as a result of client failures to maintain the security of their own systems and processes, clients are responsible for losses incurred.

To protect the confidentiality, integrity and availability of the Firm's infrastructure, resources and information, the Firm maintains a cybersecurity program designed to prevent, detect, and respond to cyberattacks. The Audit Committee is periodically provided with updates on the Firm's Information Security Program, recommended changes, cybersecurity policies and practices, ongoing efforts to improve security, as well as its efforts regarding significant cybersecurity events. In addition, the Firm has a cybersecurity incident response plan ("IRP") designed to enable the Firm to respond to attempted cybersecurity incidents, coordinate such responses with law enforcement and other government agencies, and notify clients and customers, as applicable. Among other key focus areas, the IRP is designed to mitigate the risk of insider trading connected to a cybersecurity incident, and includes various escalation points.

Due to the impact of the COVID-19 pandemic, the Firm increased the use of remote access and video conferencing solutions provided by third parties to facilitate remote work. As a result the Firm deployed additional precautionary measures and controls to mitigate cybersecurity risks and those measures and controls remain in place.

The Cybersecurity and Technology Control functions are responsible for governance and oversight of the Firm's Information Security Program. In partnership with the Firm's LOBs and Corporate, the Cybersecurity and Technology Control organization identifies information security risk issues and oversees programs for the technological protection of the Firm's information resources including applications, infrastructure as well as confidential

and personal information related to the Firm's employees and customers. The Cybersecurity and Technology Controls organization consists of business aligned information security managers that are supported within the organization by the following products that execute the Information Security Program for the Firm:

- Cyber Operations
- Identity & Access Management
- Governance, Risk & Controls
- Global Technology Product Security

The Global Cybersecurity and Technology Control governance structure is designed to identify, escalate, and mitigate information security risks. This structure uses key governance forums to disseminate information and monitor technology efforts. These forums are established at multiple levels throughout the Firm and include representatives from each LOB and Corporate. The forums are used to escalate information security risks or other matters as appropriate.

The IRM function provides oversight of the activities designed to identify, assess, measure, and mitigate cybersecurity risk.

The Firm's Security Awareness Program includes training that reinforces the Firm's Information Technology Risk and Security Management policies, standards and practices, as well as the expectation that employees comply with these policies. The Security Awareness Program engages personnel through training on how to identify potential cybersecurity risks and protect the Firm's resources and information. This training is mandatory for all employees globally on a periodic basis, and it is supplemented by Firmwide testing initiatives, including periodic phishing tests. The Firm provides specialized security training for certain employee roles such as application developers. Finally, the Firm's Global Privacy Program requires all employees to take periodic awareness training on data privacy. This privacy-focused training includes information about confidentiality and security, as well as responding to unauthorized access to or use of information.

Business and technology resiliency risk

Disruptions can occur due to forces beyond the Firm's control such as the spread of infectious diseases or pandemics, severe weather, power or telecommunications loss, failure of a third party to provide expected services, cyberattacks and, terrorism. The Firmwide Business Resiliency Program is designed to enable the Firm to prepare for, adapt to, withstand and recover from business disruptions including occurrence of an extraordinary event beyond its control that may impact critical business functions and supporting assets (i.e., staff, technology, facilities and third parties). The program includes governance, awareness training, planning and testing of recovery strategies, as well as strategic and tactical initiatives to identify, assess, and manage business interruption and public safety risks.

Payment fraud risk

Payment fraud risk is the risk of external and internal parties unlawfully obtaining personal monetary benefit through misdirected or otherwise improper payment. The risk of payment fraud normalized in 2021 since the heightened levels experienced during earlier stages of the COVID-19 pandemic. The Firm continues to employ various controls for managing payment fraud risk as well as providing employee and client education and awareness trainings.

Third-party outsourcing risk

The Firm's Third-Party Oversight ("TPO") and Inter-affiliates Oversight ("IAO") frameworks assist the LOBs and Corporate in selecting, documenting, onboarding, monitoring and managing their supplier relationships including services provided by affiliates. The objectives of the TPO framework are to hold suppliers and other third parties to a high level of operational performance and to mitigate key risks, including data loss and business disruptions. The Corporate Third-Party Oversight group is responsible for Firmwide training, monitoring, reporting and standards.

Insurance

One of the ways in which operational risk may be mitigated is through insurance maintained by the Firm. The Firm purchases insurance from commercial insurers and maintains a wholly-owned captive insurer, Park Assurance Company. Insurance may also be required by third parties with whom the Firm does business.

COMPLIANCE RISK MANAGEMENT

Compliance risk, a subcategory of operational risk, is the risk of failing to comply with laws, rules, regulations or codes of conduct and standards of self-regulatory organizations.

Overview

Each of the LOBs and Corporate hold primary ownership of and accountability for managing their compliance risk. The Firm's Operational Risk and Compliance Organization ("Operational Risk and Compliance"), which is independent of the LOBs and Corporate, provides independent review, monitoring and oversight of business operations with a focus on compliance with the laws, rules, and regulations applicable to the delivery of the Firm's products and services to clients and customers.

These compliance risks relate to a wide variety of laws, rules and regulations varying across the LOBs and Corporate, and jurisdictions, and include risks related to financial products and services, relationships and interactions with clients and customers, and employee activities. For example, compliance risks include those associated with anti-money laundering compliance, trading activities, market conduct, and complying with the laws, rules, and regulations related to the offering of products and services across jurisdictional borders. Compliance risk is also inherent in the Firm's fiduciary activities, including the failure to exercise the applicable standard of care (such as the duties of loyalty or care), to act in the best interest of clients and customers or to treat clients and customers fairly.

Other functions provide oversight of significant regulatory obligations that are specific to their respective areas of responsibility.

Operational Risk and Compliance implements policies and standards designed to govern, identify, measure, monitor and test, manage, and report on compliance risk.

Governance and oversight

Operational Risk and Compliance is led by the Firm's Global CCO and FRE for Operational Risk and Qualitative Risk Appetite.

The Firm maintains oversight and coordination of its compliance risk through the implementation of the CCOR Risk Management Framework. The Firm's Global CCO and FRE for Operational Risk and Qualitative Risk Appetite also provides regular updates to the Board Risk Committee and the Audit Committee. In certain cases, Special Purpose Committees of the Board may be established to oversee the Firm's compliance with regulatory Consent Orders.

Code of Conduct

The Firm has a Code of Conduct (the "Code") that sets forth the Firm's expectation that employees will conduct themselves with integrity at all times and provides the principles that govern employee conduct with clients, customers, shareholders and one another, as well as with the markets and communities in which the Firm does business. The Code requires employees to promptly report any potential or actual violation of the Code, any internal Firm policy, or any law or regulation applicable to the Firm's business. It also requires employees to report any illegal conduct, or conduct that violates the underlying principles of the Code, by any of the Firm's employees, clients, customers, suppliers, contract workers, business partners, or agents. Code training is assigned to newly hired employees upon joining the Firm, and to current employees periodically on an ongoing basis. Employees are required to affirm their compliance with the Code at least annually.

Employees can report any potential or actual violations of the Code through the Firm's Conduct Hotline by phone or the internet. The Hotline is anonymous, except in certain non-U.S. jurisdictions where laws prohibit anonymous reporting, and is available at all times globally, with translation services. It is administered by an outside service provider. The Code prohibits retaliation against anyone who raises an issue or concern in good faith. Periodically, the Audit Committee receives reports on the Code of Conduct program.

CONDUCT RISK MANAGEMENT

Conduct risk, a subcategory of operational risk, is the risk that any action or inaction by an employee or employees could lead to unfair client or customer outcomes, impact the integrity of the markets in which the Firm operates, or compromise the Firm's reputation.

Overview

Each LOB and Corporate is accountable for identifying and managing its conduct risk to provide appropriate engagement, ownership and sustainability of a culture consistent with the Firm's How We Do Business Principles (the "Principles"). The Principles serve as a guide for how employees are expected to conduct themselves. With the Principles serving as a guide, the Firm's Code sets out the Firm's expectations for each employee and provides information and resources to help employees conduct business ethically and in compliance with the laws everywhere the Firm operates. Refer to Compliance Risk Management on page 146 for further discussion of the Code.

Governance and oversight

The Conduct Risk Program is governed by the CCOR Management policy, which establishes the framework for governance, identification, measurement, monitoring and testing, management and reporting conduct risk in the Firm.

The Firm has a senior forum that provides oversight of the Firm's conduct initiatives to develop a more holistic view of conduct risks and to connect key programs across the Firm in order to identify opportunities and emerging areas of focus. This forum is responsible for setting overall program direction for strategic enhancements to the Firm's employee conduct framework and reviewing the consolidated Firmwide Conduct Risk Appetite Assessment.

Conduct risk management encompasses various aspects of people management practices throughout the employee life cycle, including recruiting, onboarding, training and development, performance management, promotion and compensation processes. Each LOB, Treasury and CIO, and each designated corporate function completes an assessment of conduct risk periodically, reviews metrics and issues which may involve conduct risk, and provides conduct education as appropriate.

Management's discussion and analysis

LEGAL RISK MANAGEMENT

Legal risk, a subcategory of operational risk, is the risk of loss primarily caused by the actual or alleged failure to meet legal obligations that arise from the rule of law in jurisdictions in which the Firm operates, agreements with clients and customers, and products and services offered by the Firm.

Overview

The global Legal function ("Legal") provides legal services and advice to the Firm. Legal is responsible for managing the Firm's exposure to legal risk by:

- managing actual and potential litigation and enforcement matters, including internal reviews and investigations related to such matters
- advising on products and services, including contract negotiation and documentation
- advising on offering and marketing documents and new business initiatives
- managing dispute resolution
- interpreting existing laws, rules and regulations, and advising on changes to them
- advising on advocacy in connection with contemplated and proposed laws, rules and regulations, and
- providing legal advice to the LOBs, Corporate and the Board.

Legal selects, engages and manages outside counsel for the Firm on all matters in which outside counsel is engaged. In addition, Legal advises the Firm's Conflicts Office which reviews the Firm's wholesale transactions that may have the potential to create conflicts of interest for the Firm.

Governance and oversight

The Firm's General Counsel reports to the CEO and is a member of the Operating Committee, the Firmwide Risk Committee and the Firmwide Control Committee. The Firm's General Counsel and other members of Legal report on significant legal matters to the Firm's Board of Directors and to the Audit Committee.

Legal serves on and advises various committees and advises the Firm's LOBs and Corporate on potential reputation risk issues.

ESTIMATIONS AND MODEL RISK MANAGEMENT

Estimations and Model risk, a subcategory of operational risk, is the potential for adverse consequences from decisions based on incorrect or misused estimation outputs.

The Firm uses models and other analytical and judgment-based estimations across various businesses and functions. The estimation methods are of varying levels of sophistication and are used for many purposes, such as the valuation of positions and measurement of risk, assessing regulatory capital requirements, conducting stress testing, evaluating the allowance for credit losses and making business decisions. A dedicated independent function, Model Risk Governance and Review (“MRGR”), defines and governs the Firm’s policies relating to the management of model risk and risks associated with certain analytical and judgment-based estimations, such as those used in risk management, budget forecasting and capital planning and analysis.

The governance of analytical and judgment-based estimations within MRGR’s scope follows a consistent approach which is used for models, as described in detail below.

Model risks are owned by the users of the models within the Firm based on the specific purposes of such models. Users and developers of models are responsible for developing, implementing and testing their models, as well as referring models to the MRGR for review and approval. Once models have been approved, model users and developers are responsible for maintaining a robust operating environment, and must monitor and evaluate the performance of the models on an ongoing basis. Model users and developers may seek to enhance models in response to changes in the portfolios and in product and market developments, as well as to capture improvements in available modeling techniques and systems capabilities.

Models are tiered based on an internal standard according to their complexity, the exposure associated with the model and the Firm’s reliance on the model. This tiering is subject to the approval of the MRGR. In its review of a model, the MRGR considers whether the model is suitable for the specific purposes for which it will be used. When reviewing a model, the MRGR analyzes and challenges the model methodology and the reasonableness of model assumptions, and may perform or require additional testing, including back-testing of model outcomes. Model reviews are approved by the appropriate level of management within the MRGR based on the relevant model tier.

Under the Firm’s Estimations and Model Risk Management Policy, the MRGR reviews and approves new models, as well as material changes to existing models, prior to their use. In certain circumstances exceptions may be granted to the Firm’s policy to allow a model to be used prior to review or approval. The MRGR may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

While models are inherently imprecise, the degree of imprecision or uncertainty can be heightened by the market or economic environment. This is particularly true when the current and forecasted environment is significantly different from the historical macroeconomic environments upon which the models were trained, as the Firm experienced during the early stages of the COVID-19 pandemic. This uncertainty may necessitate a greater degree of judgment and analytics to inform adjustments to model outputs than in typical periods.

Refer to Critical Accounting Estimates Used by the Firm on pages 150-153 and Note 2 for a summary of model-based valuations and other valuation techniques.

CRITICAL ACCOUNTING ESTIMATES USED BY THE FIRM

JPMorgan Chase's accounting policies and use of estimates are integral to understanding its reported results. The Firm's most complex accounting estimates require management's judgment to ascertain the appropriate carrying value of assets and liabilities. The Firm has established policies and control procedures intended to ensure that estimation methods, including any judgments made as part of such methods, are well-controlled, independently reviewed and applied consistently from period to period. The methods used and judgments made reflect, among other factors, the nature of the assets or liabilities and the related business and risk management strategies, which may vary across the Firm's businesses and portfolios. In addition, the policies and procedures are intended to ensure that the process for changing methodologies occurs in an appropriate manner. The Firm believes its estimates for determining the carrying value of its assets and liabilities are appropriate. The following is a brief description of the Firm's critical accounting estimates involving significant judgments.

Allowance for credit losses

The Firm's allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The allowance for credit losses comprises:

- The allowance for loan losses, which covers the Firm's retained loan portfolios (scored and risk-rated),
- The allowance for lending-related commitments, and
- The allowance for credit losses on investment securities.

The allowance for credit losses involves significant judgment on a number of matters including development and weighting of macroeconomic forecasts, incorporation of historical loss experience, assessment of risk characteristics, assignment of risk ratings, valuation of collateral, and the determination of remaining expected life. Refer to Note 10 and Note 13 for further information on these judgments as well as the Firm's policies and methodologies used to determine the Firm's allowance for credit losses.

One of the most significant judgments involved in estimating the Firm's allowance for credit losses relates to the macroeconomic forecasts used to estimate credit losses over the eight-quarter forecast period within the Firm's methodology. The eight-quarter forecast incorporates hundreds of MEVs that are relevant for exposures across the Firm, with modeled credit losses being driven primarily by a subset of less than twenty variables. The specific variables that have the greatest effect on the modeled losses of each portfolio vary by portfolio and geography.

- Key MEVs for the consumer portfolio include U.S. unemployment, HPI and U.S. real GDP.

- Key MEVs for the wholesale portfolio include U.S. real GDP, U.S. unemployment, U.S. equity prices, corporate credit spreads, oil prices, commercial real estate prices and HPI.

Changes in the Firm's assumptions and forecasts of economic conditions could significantly affect its estimate of expected credit losses in the portfolio at the balance sheet date or lead to significant changes in the estimate from one reporting period to the next.

The Firm's allowance for credit losses is estimated using a weighted average of five internally developed macroeconomic scenarios. As of December 31, 2021, the Firm assigned more balanced weightings to both its adverse and upside scenarios compared to the significant weighting that the Firm placed on its adverse scenarios as of December 31, 2020, reflecting the sustained improvement and resilience of the macroeconomic environment, despite the ongoing impact of the COVID-19 pandemic. In addition, because the impact of the COVID-19 pandemic and governmental actions taken in response to the pandemic caused a dislocation in certain historical relationships used for modeling credit loss estimates, the Firm continues to place reliance on management judgment and make adjustments specific to that dislocation, although to a lesser extent than in 2020. The allowance for credit losses of \$18.7 billion reflects remaining uncertainties, including the potential impact that additional waves or variants of COVID-19 may have on the pace of economic growth and near-term supply chain disruptions.

It is difficult to estimate how potential changes in any one factor or input might affect the overall allowance for credit losses because management considers a wide variety of factors and inputs in estimating the allowance for credit losses. Changes in the factors and inputs considered may not occur at the same rate and may not be consistent across all geographies or product types, and changes in factors and inputs may be directionally inconsistent, such that improvement in one factor or input may offset deterioration in others.

To consider the impact of a hypothetical alternate macroeconomic forecast, the Firm compared the modeled credit losses determined using its central and relative adverse macroeconomic scenarios, which are two of the five scenarios considered in estimating the allowances for loan losses and lending-related commitments. The central and relative adverse scenarios each included a full suite of MEVs, but differed in the levels, paths and peaks/troughs of those variables over the eight-quarter forecast period.

For example, compared to the Firm's central scenario shown on page 129 and in Note 13, the Firm's relative adverse scenario assumes a significantly elevated U.S. unemployment rate, averaging approximately 2.8% higher over the eight-quarter forecast, with a peak difference of approximately 4.4% in the second quarter of 2022; lower U.S. real GDP with a slower recovery, remaining nearly

3.2% lower at the end of the eight-quarter forecast, with a peak difference of approximately 6.5% in the second quarter of 2022; and lower national HPI with a peak difference of nearly 15.8% in the second quarter of 2023.

This analysis is not intended to estimate expected future changes in the allowance for credit losses as the impacts of changes in many MEVs are both interrelated and nonlinear, so the results of this analysis cannot be simply extrapolated for more severe changes in macroeconomic variables. Additionally, expectations of future changes in portfolio composition and borrower behavior can significantly affect the allowance for credit losses.

To demonstrate the sensitivity of credit loss estimates to macroeconomic forecasts as of December 31, 2021, the Firm compared the modeled estimates under its relative adverse scenario to its central scenario. Without considering offsetting or correlated effects in other qualitative components of the Firm's allowance for credit losses, the comparison between these two scenarios for the lending exposures below reflect the following differences:

- An increase of approximately \$550 million for residential real estate loans and lending-related commitments
- An increase of approximately \$2.6 billion for credit card loans
- An increase of approximately \$3.0 billion for wholesale loans and lending-related commitments

This analysis relates only to the modeled credit loss estimates and is not intended to estimate changes in the overall allowance for credit losses as it does not reflect any potential changes in other adjustments to the quantitative calculation, which would also be influenced by the judgment management applies to the modeled lifetime loss estimates to reflect the uncertainty and imprecision of these modeled lifetime loss estimates based on then-current circumstances and conditions.

Recognizing that forecasts of macroeconomic conditions are inherently uncertain, particularly in light of the recent economic conditions, the Firm believes that its process to consider the available information and associated risks and uncertainties is appropriately governed and that its estimates of expected credit losses were reasonable and appropriate for the period ended December 31, 2021.

Fair value

JPMorgan Chase carries a portion of its assets and liabilities at fair value. The majority of such assets and liabilities are measured at fair value on a recurring basis, including, derivatives and structured note products. Certain assets and liabilities are measured at fair value on a nonrecurring basis, including certain mortgage, home equity and other loans, where the carrying value is based on the fair value of the underlying collateral.

Assets measured at fair value

The following table includes the Firm's assets measured at fair value and the portion of such assets that are classified

within level 3 of the fair value hierarchy. Refer to Note 2 for further information.

December 31, 2021 (in billions, except ratios)	Total assets at fair value	Total level 3 assets
Federal Funds sold and securities purchased under resale agreements	\$ 252.7	\$ –
Securities borrowed	81.5	–
Trading assets:		
Trading debt and equity instruments	376.4	2.3
Derivative receivables ^(a)	57.1	7.3
Total trading assets	433.5	9.6
AFS securities	308.5	0.2
Loans	58.8	1.9
MSRs	5.5	5.5
Other	14.0	0.3
Total assets measured at fair value on a recurring basis	1,154.5	17.5
Total assets measured at fair value on a nonrecurring basis	3.5	2.5
Total assets measured at fair value	\$ 1,158.0	\$ 20.0
Total Firm assets	\$ 3,743.6	
Level 3 assets at fair value as a percentage of total Firm assets ^(a)		0.5%
Level 3 assets at fair value as a percentage of total Firm assets at fair value ^(a)		1.7%

(a) For purposes of the table above, the derivative receivables total reflects the impact of netting adjustments; however, the \$7.3 billion of derivative receivables classified as level 3 does not reflect the netting adjustment as such netting is not relevant to a presentation based on the transparency of inputs to the valuation of an asset. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral.

Valuation

Details of the Firm's processes for determining fair value are set out in Note 2. Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Firm. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, the lack of observability of certain significant inputs requires management to assess relevant empirical data in deriving valuation inputs including, for example, transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves. Refer to Note 2 for a further discussion of the valuation of level 3 instruments, including unobservable inputs used.

Management's discussion and analysis

For instruments classified in levels 2 and 3, management judgment must be applied to assess the appropriate level of valuation adjustments to reflect counterparty credit quality, the Firm's creditworthiness, market funding rates, liquidity considerations, unobservable parameters, and for portfolios that meet specified criteria, the size of the net open risk position. The judgments made are typically affected by the type of product and its specific contractual terms, and the level of liquidity for the product or within the market as a whole. In periods of heightened market volatility and uncertainty judgments are further affected by the wider variation of reasonable valuation estimates, particularly for positions that are less liquid. Refer to Note 2 for a further discussion of valuation adjustments applied by the Firm.

Imprecision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Firm believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Firm's businesses and portfolios.

The Firm uses various methodologies and assumptions in the determination of fair value. The use of methodologies or assumptions different than those used by the Firm could result in a different estimate of fair value at the reporting date. Refer to Note 2 for a detailed discussion of the Firm's valuation process and hierarchy, and its determination of fair value for individual financial instruments.

Goodwill impairment

Under U.S. GAAP, goodwill must be allocated to reporting units and tested for impairment at least annually. The Firm's process and methodology used to conduct goodwill impairment testing is described in Note 15.

Management applies significant judgment when testing goodwill for impairment. The goodwill associated with each business combination is allocated to the related reporting units for goodwill impairment testing.

For the year ended December 31, 2021, the Firm reviewed current economic conditions, including the potential impacts of the COVID-19 pandemic on business performance, estimated market cost of equity, as well as actual business results and projections of business performance for its reporting units. The Firm has concluded that the goodwill allocated to its reporting units was not impaired as of December 31, 2021. For each of the reporting units, fair value exceeded carrying value by at least 10% and there was no indication of a significant risk of goodwill impairment based on current projections and valuations.

The projections for the Firm's reporting units are consistent with management's current business outlook assumptions in the short term, and the Firm's best estimates of long-term growth and return on equity in the longer term. Where possible, the Firm uses third-party and peer data to benchmark its assumptions and estimates.

Refer to Note 15 for additional information on goodwill, including the goodwill impairment assessment as of December 31, 2021.

Credit card rewards liability

JPMorgan Chase offers credit cards with various rewards programs which allow cardholders to earn rewards points based on their account activity and the terms and conditions of the rewards program. Generally, there are no limits on the points that an eligible cardholder can earn, nor do the points expire, and the points can be redeemed for a variety of rewards, including cash (predominantly in the form of account credits), gift cards and travel. The Firm maintains a rewards liability which represents the estimated cost of rewards points earned and expected to be redeemed by cardholders. The liability is accrued as the cardholder earns the benefit and is reduced when the cardholder redeems points. This liability was \$9.8 billion and \$7.7 billion at December 31, 2021 and 2020, respectively, and is recorded in accounts payable and other liabilities on the Consolidated balance sheets. The increase in the liability was driven by continued growth in rewards points earned on increased spend and promotional offers outpacing redemptions throughout 2021, and to a lesser extent adjustments to redemption rate assumptions.

The rewards liability is sensitive to redemption rate ("RR") and cost per point ("CPP") assumptions. The RR assumption is used to estimate the number of points earned by customers that will be redeemed over the life of the account. The CPP assumption is used to estimate the cost of future point redemptions. These assumptions are evaluated periodically considering historical actuals, cardholder redemption behavior and management judgment. Updates to these assumptions will impact the rewards liability. As of December 31, 2021, a combined increase of 25 basis points in RR and 1 basis point in CPP would increase the rewards liability by approximately \$265 million.

Income taxes

JPMorgan Chase is subject to the income tax laws of the various jurisdictions in which it operates, including U.S. federal, state and local, and non-U.S. jurisdictions. These laws are often complex and may be subject to different interpretations. To determine the financial statement impact of accounting for income taxes, including the provision for income tax expense and unrecognized tax benefits, JPMorgan Chase must make assumptions and judgments about how to interpret and apply these complex tax laws to numerous transactions and business events, as well as make judgments regarding the timing of when certain items may affect taxable income in the U.S. and non-U.S. tax jurisdictions.

JPMorgan Chase's interpretations of tax laws around the world are subject to review and examination by the various taxing authorities in the jurisdictions where the Firm operates, and disputes may occur regarding its view on a tax position. These disputes over interpretations with the various taxing authorities may be settled by audit, administrative appeals or adjudication in the court systems

of the tax jurisdictions in which the Firm operates. JPMorgan Chase regularly reviews whether it may be assessed additional income taxes as a result of the resolution of these matters, and the Firm records additional unrecognized tax benefits, as appropriate. In addition, the Firm may revise its estimate of income taxes due to changes in income tax laws, legal interpretations, and business strategies. It is possible that revisions in the Firm's estimate of income taxes may materially affect the Firm's results of operations in any reporting period.

Deferred taxes arise from differences between assets and liabilities measured for financial reporting versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. Deferred taxes are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred taxes of a change in tax rates is recognized within the provision for income taxes in the period enacted.

The Firm has also recognized deferred tax assets in connection with certain tax attributes, including net operating loss ("NOL") carryforwards and foreign tax credit ("FTC") carryforwards. The Firm performs regular reviews to ascertain whether its deferred tax assets are realizable. These reviews include management's estimates and assumptions regarding future taxable income, including foreign source income, and may incorporate various tax planning strategies, including strategies that may be available to utilize NOLs and FTCs before they expire. In connection with these reviews, if it is determined that a deferred tax asset is not realizable, a valuation allowance is established. The valuation allowance may be reversed in a subsequent reporting period if the Firm determines that, based on revised estimates of future taxable income or changes in tax planning strategies, it is more likely than not that all or part of the deferred tax asset will become realizable. As of December 31, 2021, management has determined it is more likely than not that the Firm will realize its deferred tax assets, net of the existing valuation allowance.

The Firm adjusts its unrecognized tax benefits as necessary when new information becomes available, including changes in tax law and regulations, and interactions with taxing authorities. Uncertain tax positions that meet the more-likely-than-not recognition threshold are measured to determine the amount of benefit to recognize. An uncertain tax position is measured at the largest amount of benefit that management believes is more likely than not to be realized upon settlement. It is possible that the reassessment of JPMorgan Chase's unrecognized tax benefits may have a material impact on its effective income tax rate in the period in which the reassessment occurs. Although the Firm believes that its estimates are reasonable, the final tax amount could be different from the amounts reflected in the Firm's income tax provisions and accruals. To the extent that the final outcome of these

amounts is different than the amounts recorded, such differences will generally impact the Firm's provision for income taxes in the period in which such a determination is made.

The Firm's provision for income taxes is composed of current and deferred taxes. The current and deferred tax provisions are calculated based on estimates and assumptions that could differ from the actual results reflected in income tax returns filed during the subsequent year. Adjustments based on filed returns are generally recorded in the period when the tax returns are filed and the global tax implications are known, which could impact the Firm's effective tax rate.

Refer to Note 25 for additional information on income taxes.

Litigation reserves

Refer to Note 30 for a description of the significant estimates and judgments associated with establishing litigation reserves.

Management's discussion and analysis

ACCOUNTING AND REPORTING DEVELOPMENTS

Financial Accounting Standards Board ("FASB") Standards Adopted since January 1, 2021

Standard	Summary of guidance	Effects on financial statements
Reference Rate Reform <i>Issued March 2020 and updated January 2021</i>	<ul style="list-style-type: none">• Provides optional expedients and exceptions to current accounting guidance when financial instruments, hedge accounting relationships, and other transactions are amended due to reference rate reform.• Provides an election to account for certain contract amendments related to reference rate reform as modifications rather than extinguishments without the requirement to assess the significance of the amendments.• Allows for changes in critical terms of a hedge accounting relationship without automatic termination of that relationship. Provides various practical expedients and elections designed to allow hedge accounting to continue uninterrupted during the transition period.• Provides a one-time election to transfer securities out of the held-to-maturity classification if certain criteria are met.• The January 2021 update provides an election to account for derivatives modified to change the rate used for discounting, margining, or contract price alignment (collectively "discounting transition") as modifications.	<ul style="list-style-type: none">• Issued and effective March 12, 2020. The January 7, 2021 update was effective when issued.• The Firm elected to apply certain of the practical expedients related to contract modifications and hedge accounting relationships, and discounting transition beginning in the third quarter of 2020. The discounting transition election was applied retrospectively. The main purpose of the practical expedients is to ease the administrative burden of accounting for contracts impacted by reference rate reform. These elections did not have a material impact on the Consolidated Financial Statements.

FORWARD-LOOKING STATEMENTS

From time to time, the Firm has made and will make forward-looking statements. These statements can be identified by the fact that they do not relate strictly to historical or current facts. Forward-looking statements often use words such as “anticipate,” “target,” “expect,” “estimate,” “intend,” “plan,” “goal,” “believe,” or other words of similar meaning. Forward-looking statements provide JPMorgan Chase’s current expectations or forecasts of future events, circumstances, results or aspirations. JPMorgan Chase’s disclosures in this 2021 Form 10-K contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. The Firm also may make forward-looking statements in its other documents filed or furnished with the SEC. In addition, the Firm’s senior management may make forward-looking statements orally to investors, analysts, representatives of the media and others.

All forward-looking statements are, by their nature, subject to risks and uncertainties, many of which are beyond the Firm’s control. JPMorgan Chase’s actual future results may differ materially from those set forth in its forward-looking statements. While there is no assurance that any list of risks and uncertainties or risk factors is complete, below are certain factors which could cause actual results to differ from those in the forward-looking statements:

- Economic, financial, reputational and other impacts of the COVID-19 pandemic;
- Local, regional and global business, economic and political conditions and geopolitical events;
- Changes in laws, rules, and regulatory requirements, including capital and liquidity requirements affecting the Firm’s businesses, and the ability of the Firm to address those requirements;
- Heightened regulatory and governmental oversight and scrutiny of JPMorgan Chase’s business practices, including dealings with retail customers;
- Changes in trade, monetary and fiscal policies and laws;
- Changes in the level of inflation;
- Changes in income tax laws, rules, and regulations;
- Securities and capital markets behavior, including changes in market liquidity and volatility;
- Changes in investor sentiment or consumer spending or savings behavior;
- Ability of the Firm to manage effectively its capital and liquidity;
- Changes in credit ratings assigned to the Firm or its subsidiaries;
- Damage to the Firm’s reputation;
- Ability of the Firm to appropriately address social, environmental and sustainability concerns that may arise, including from its business activities;
- Ability of the Firm to deal effectively with an economic slowdown or other economic or market disruption, including, but not limited to, in the interest rate environment;
- Technology changes instituted by the Firm, its counterparties or competitors;
- The effectiveness of the Firm’s control agenda;
- Ability of the Firm to develop or discontinue products and services, and the extent to which products or services previously sold by the Firm require the Firm to incur liabilities or absorb losses not contemplated at their initiation or origination;
- Acceptance of the Firm’s new and existing products and services by the marketplace and the ability of the Firm to innovate and to increase market share;
- Ability of the Firm to attract and retain qualified and diverse employees;
- Ability of the Firm to control expenses;
- Competitive pressures;
- Changes in the credit quality of the Firm’s clients, customers and counterparties;
- Adequacy of the Firm’s risk management framework, disclosure controls and procedures and internal control over financial reporting;
- Adverse judicial or regulatory proceedings;
- Changes in applicable accounting policies, including the introduction of new accounting standards;
- Ability of the Firm to determine accurate values of certain assets and liabilities;
- Occurrence of natural or man-made disasters or calamities, including health emergencies, the spread of infectious diseases, epidemics or pandemics, an outbreak or escalation of hostilities or other geopolitical instabilities, the effects of climate change or extraordinary events beyond the Firm’s control, and the Firm’s ability to deal effectively with disruptions caused by the foregoing;
- Ability of the Firm to maintain the security of its financial, accounting, technology, data processing and other operational systems and facilities;
- Ability of the Firm to withstand disruptions that may be caused by any failure of its operational systems or those of third parties;
- Ability of the Firm to effectively defend itself against cyber attacks and other attempts by unauthorized parties to access information of the Firm or its customers or to disrupt the Firm’s systems; and
- The other risks and uncertainties detailed in Part I, Item 1A: Risk Factors in JPMorgan Chase’s 2021 Form 10-K.

Any forward-looking statements made by or on behalf of the Firm speak only as of the date they are made, and JPMorgan Chase does not undertake to update any forward-looking statements. The reader should, however, consult any further disclosures of a forward-looking nature the Firm may make in any subsequent Form 10-Ks, Quarterly Reports on Form 10-Qs, or Current Reports on Form 8-K.

Management's report on internal control over financial reporting

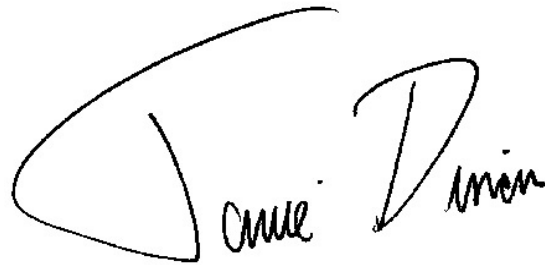
Management of JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm") is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed by, or under the supervision of, the Firm's principal executive and principal financial officers, or persons performing similar functions, and effected by JPMorgan Chase's Board of Directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP").

JPMorgan Chase's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records, that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the Firm's assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. GAAP, and that receipts and expenditures of the Firm are being made only in accordance with authorizations of JPMorgan Chase's management and directors; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Firm's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. Management has completed an assessment of the effectiveness of the Firm's internal control over financial reporting as of December 31, 2021. In making the assessment, management used the "Internal Control – Integrated Framework" ("COSO 2013") promulgated by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO").

Based upon the assessment performed, management concluded that as of December 31, 2021, JPMorgan Chase's internal control over financial reporting was effective based upon the COSO 2013 framework. Additionally, based upon management's assessment, the Firm determined that there were no material weaknesses in its internal control over financial reporting as of December 31, 2021.

The effectiveness of the Firm's internal control over financial reporting as of December 31, 2021, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

A handwritten signature in black ink that reads "James Dimon". The signature is written in a cursive style with a large, sweeping initial "J".

James Dimon
Chairman and Chief Executive Officer

A handwritten signature in black ink that reads "Jeremy Barnum". The signature is written in a cursive style with a large, sweeping initial "J".

Jeremy Barnum
Executive Vice President and Chief Financial Officer

February 22, 2022



To the Board of Directors and Shareholders of JPMorgan Chase & Co.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of JPMorgan Chase & Co. and its subsidiaries (the “Firm”) as of December 31, 2021 and 2020, and the related consolidated statements of income, comprehensive income, changes in stockholders’ equity and cash flows for each of the three years in the period ended December 31, 2021, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Firm’s internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Firm as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Firm maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 1 to the consolidated financial statements, the Firm changed the manner in which it accounts for credit losses on certain financial instruments in 2020.

Basis for Opinions

The Firm’s management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s report on internal control over financial reporting. Our responsibility is to express opinions on the Firm’s consolidated financial statements and on the Firm’s internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Firm in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Report of Independent Registered Public Accounting Firm

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Allowance for Loan Losses - Portfolio-based component of Wholesale Loan and Credit Card Loan Portfolios

As described in Note 13 to the consolidated financial statements, the allowance for loan losses for the portfolio-based component of the wholesale and credit card loan portfolios was \$14.0 billion on total portfolio-based retained loans of \$711.4 billion at December 31, 2021. The Firm's allowance for loan losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's loan portfolios and considers expected future changes in macroeconomic conditions. The portfolio-based component of the Firm's allowance for loan losses for the wholesale and credit card retained loan portfolios begins with a quantitative calculation of expected credit losses over the expected life of the loan by applying credit loss factors to the estimated exposure at default. The credit loss factors applied are determined based on the weighted average of five internally developed macroeconomic scenarios that take into consideration the Firm's economic outlook as derived through forecast macroeconomic variables, the most significant of which are U.S. unemployment and U.S. real gross domestic product. This quantitative calculation is further adjusted to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate.

The principal considerations for our determination that performing procedures relating to the allowance for loan losses for the portfolio-based component of the wholesale and credit card loan portfolios is a critical audit matter are (i) the significant judgment and estimation by management in the forecast of macroeconomic variables, specifically U.S. unemployment and U.S. real gross domestic product, as the Firm's forecasts of economic conditions significantly affect its estimate of expected credit losses at the balance sheet date, (ii) the significant judgment and estimation by management in determining the quantitative calculation utilized in their credit loss estimates and the adjustments to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate, which both in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures and in

evaluating audit evidence obtained relating to the credit loss estimates and the appropriateness of the adjustments to the credit loss estimates, and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the Firm's allowance for loan losses, including controls over model validation and generation of macroeconomic scenarios. These procedures also included, among others, testing management's process for estimating the allowance for loan losses, which involved (i) evaluating the appropriateness of the models and methodologies used in quantitative calculations; (ii) evaluating the reasonableness of forecasts of U.S. unemployment and U.S. real gross domestic product; (iii) testing the completeness and accuracy of data used in the estimate; and (iv) evaluating the reasonableness of management's adjustments to the quantitative output for the impacts of model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate. These procedures also included the use of professionals with specialized skill and knowledge to assist in evaluating the appropriateness of certain models, methodologies and macroeconomic variables.

Fair Value of Certain Level 3 Financial Instruments

As described in Notes 2 and 3 to the consolidated financial statements, the Firm carries \$1.2 trillion of its assets and \$403.1 billion of its liabilities at fair value on a recurring basis. Included in these balances are \$9.6 billion of trading assets and \$41.5 billion of liabilities measured at fair value on a recurring basis, collectively financial instruments, which are classified as level 3 as they contain one or more inputs to valuation which are unobservable and significant to their fair value measurement. The Firm utilized internally developed valuation models and unobservable inputs to estimate fair value of the level 3 financial instruments. The unobservable inputs used by management to estimate the fair value of certain of these financial instruments include forward equity prices, volatility relating to interest rates and equity prices and correlation relating to interest rates, equity prices, credit and foreign exchange rates.

The principal considerations for our determination that performing procedures relating to the fair value of certain level 3 financial instruments is a critical audit matter are (i) the significant judgment and estimation by management in determining the inputs to estimate fair value, which in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and in evaluating audit evidence obtained related to the fair value of these financial instruments, and (ii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our

Report of Independent Registered Public Accounting Firm

overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the Firm's determination of the fair value, including controls over models, inputs, and data. These procedures also included, among others, the involvement of professionals with specialized skill and knowledge to assist in developing an independent estimate of fair value for a sample of these financial instruments and comparing management's estimate to the independently developed estimate of fair value. Developing the independent estimate involved testing the completeness and accuracy of data provided by management, developing independent inputs and, as appropriate, evaluating and utilizing management's aforementioned unobservable inputs.

The image shows a handwritten signature in black ink that reads "PricewaterhouseCoopers LLP". The signature is written in a cursive, flowing style, with the letters connected together. The "P" is particularly large and loops around the start of the word "PricewaterhouseCoopers".

February 22, 2022

We have served as the Firm's auditor since 1965.

JPMorgan Chase & Co.
Consolidated statements of income

Year ended December 31, (in millions, except per share data)	2021	2020	2019
Revenue			
Investment banking fees	\$ 13,216	\$ 9,486	\$ 7,501
Principal transactions	16,304	18,021	14,018
Lending- and deposit-related fees	7,032	6,511	6,626
Asset management, administration and commissions	21,029	18,177	16,908
Investment securities gains/(losses)	(345)	802	258
Mortgage fees and related income	2,170	3,091	2,036
Card income	5,102	4,435	5,076
Other income ^(a)	4,830	4,865	6,052
Noninterest revenue	69,338	65,388	58,475
Interest income	57,864	64,523	84,040
Interest expense	5,553	9,960	26,795
Net interest income	52,311	54,563	57,245
Total net revenue	121,649	119,951	115,720
Provision for credit losses	(9,256)	17,480	5,585
Noninterest expense			
Compensation expense	38,567	34,988	34,155
Occupancy expense	4,516	4,449	4,322
Technology, communications and equipment expense	9,941	10,338	9,821
Professional and outside services	9,814	8,464	8,533
Marketing	3,036	2,476	3,351
Other expense	5,469	5,941	5,087
Total noninterest expense	71,343	66,656	65,269
Income before income tax expense	59,562	35,815	44,866
Income tax expense ^(a)	11,228	6,684	8,435
Net income	\$ 48,334	\$ 29,131	\$ 36,431
Net income applicable to common stockholders	\$ 46,503	\$ 27,410	\$ 34,642
Net income per common share data			
Basic earnings per share	\$ 15.39	\$ 8.89	\$ 10.75
Diluted earnings per share	15.36	8.88	10.72
Weighted-average basic shares	3,021.5	3,082.4	3,221.5
Weighted-average diluted shares	3,026.6	3,087.4	3,230.4

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

The Notes to Consolidated Financial Statements are an integral part of these statements.

JPMorgan Chase & Co.
Consolidated statements of comprehensive income

Year ended December 31, (in millions)	2021		2020		2019	
Net income	\$	48,334	\$	29,131	\$	36,431
Other comprehensive income/(loss), after-tax						
Unrealized gains/(losses) on investment securities		(5,540)		4,123		2,855
Translation adjustments, net of hedges		(461)		234		20
Fair value hedges		(19)		19		30
Cash flow hedges		(2,679)		2,320		172
Defined benefit pension and OPEB plans		922		212		964
DVA on fair value option elected liabilities		(293)		(491)		(965)
Total other comprehensive income/(loss), after-tax		(8,070)		6,417		3,076
Comprehensive income	\$	40,264	\$	35,548	\$	39,507

The Notes to Consolidated Financial Statements are an integral part of these statements.

JPMorgan Chase & Co.

Consolidated balance sheets

December 31, (in millions, except share data)	2021	2020
Assets		
Cash and due from banks	\$ 26,438	\$ 24,874
Deposits with banks	714,396	502,735
Federal funds sold and securities purchased under resale agreements (included \$252,720 and \$238,015 at fair value)	261,698	296,284
Securities borrowed (included \$81,463 and \$52,983 at fair value)	206,071	160,635
Trading assets (included assets pledged of \$102,710 and \$130,645)	433,575	503,126
Available-for-sale securities (amortized cost of \$308,254 and \$381,729, net of allowance for credit losses; included assets pledged of \$18,268 and \$32,227)	308,525	388,178
Held-to-maturity securities, net of allowance for credit losses	363,707	201,821
Investment securities, net of allowance for credit losses	672,232	589,999
Loans (included \$58,820 and \$44,474 at fair value)	1,077,714	1,012,853
Allowance for loan losses	(16,386)	(28,328)
Loans, net of allowance for loan losses	1,061,328	984,525
Accrued interest and accounts receivable	102,570	90,503
Premises and equipment	27,070	27,109
Goodwill, MSRs and other intangible assets	56,691	53,428
Other assets (included \$14,753 and \$13,827 at fair value and assets pledged of \$5,298 and \$3,739) ^(a)	181,498	151,539
Total assets^(b)	\$ 3,743,567	\$ 3,384,757
Liabilities		
Deposits (included \$11,333 and \$14,484 at fair value)	\$ 2,462,303	\$ 2,144,257
Federal funds purchased and securities loaned or sold under repurchase agreements (included \$126,435 and \$155,735 at fair value)	194,340	215,209
Short-term borrowings (included \$20,015 and \$16,893 at fair value)	53,594	45,208
Trading liabilities	164,693	170,181
Accounts payable and other liabilities (included \$5,651 and \$3,476 at fair value) ^(a)	262,755	231,285
Beneficial interests issued by consolidated VIEs (included \$12 and \$41 at fair value)	10,750	17,578
Long-term debt (included \$74,934 and \$76,817 at fair value)	301,005	281,685
Total liabilities^(b)	3,449,440	3,105,403
Commitments and contingencies (refer to Notes 28, 29 and 30)		
Stockholders' equity		
Preferred stock (\$1 par value; authorized 200,000,000 shares; issued 3,483,750 and 3,006,250 shares)	34,838	30,063
Common stock (\$1 par value; authorized 9,000,000,000 shares; issued 4,104,933,895 shares)	4,105	4,105
Additional paid-in capital	88,415	88,394
Retained earnings	272,268	236,990
Accumulated other comprehensive income	(84)	7,986
Treasury stock, at cost (1,160,784,750 and 1,055,499,435 shares)	(105,415)	(88,184)
Total stockholders' equity	294,127	279,354
Total liabilities and stockholders' equity	\$ 3,743,567	\$ 3,384,757

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

(b) The following table presents information on assets and liabilities related to VIEs that are consolidated by the Firm at December 31, 2021 and 2020. The assets of the consolidated VIEs are used to settle the liabilities of those entities. The holders of the beneficial interests do not have recourse to the general credit of JPMorgan Chase. The assets and liabilities in the table below include third-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation. Refer to Note 14 for a further discussion.

December 31, (in millions)	2021	2020
Assets		
Trading assets	\$ 2,010	\$ 1,934
Loans	33,024	37,619
All other assets	490	681
Total assets	\$ 35,524	\$ 40,234
Liabilities		
Beneficial interests issued by consolidated VIEs	\$ 10,750	\$ 17,578
All other liabilities	245	233
Total liabilities	\$ 10,995	\$ 17,811

The Notes to Consolidated Financial Statements are an integral part of these statements.

JPMorgan Chase & Co.
Consolidated statements of changes in stockholders' equity

Year ended December 31, (in millions, except per share data)	2021	2020	2019
Preferred stock			
Balance at January 1	\$ 30,063	\$ 26,993	\$ 26,068
Issuance	7,350	4,500	5,000
Redemption	(2,575)	(1,430)	(4,075)
Balance at December 31	34,838	30,063	26,993
Common stock			
Balance at January 1 and December 31	4,105	4,105	4,105
Additional paid-in capital			
Balance at January 1	88,394	88,522	89,162
Shares issued and commitments to issue common stock for employee share-based compensation awards, and related tax effects	152	(72)	(591)
Other	(131)	(56)	(49)
Balance at December 31	88,415	88,394	88,522
Retained earnings			
Balance at January 1	236,990	223,211	199,202
Cumulative effect of change in accounting principles	–	(2,650)	62
Net income	48,334	29,131	36,431
Dividends declared:			
Preferred stock	(1,600)	(1,583)	(1,587)
Common stock (\$3.80, \$3.60 and \$3.40 per share for 2021, 2020 and 2019, respectively)	(11,456)	(11,119)	(10,897)
Balance at December 31	272,268	236,990	223,211
Accumulated other comprehensive income/(loss)			
Balance at January 1	7,986	1,569	(1,507)
Other comprehensive income/(loss), after-tax	(8,070)	6,417	3,076
Balance at December 31	(84)	7,986	1,569
Shares held in RSU Trust, at cost			
Balance at January 1	–	(21)	(21)
Liquidation of RSU Trust	–	21	–
Balance at December 31	–	–	(21)
Treasury stock, at cost			
Balance at January 1	(88,184)	(83,049)	(60,494)
Repurchase	(18,448)	(6,397)	(24,121)
Reissuance	1,217	1,262	1,566
Balance at December 31	(105,415)	(88,184)	(83,049)
Total stockholders' equity	\$ 294,127	\$ 279,354	\$ 261,330

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of cash flows

Year ended December 31, (in millions)	2021	2020	2019
Operating activities			
Net income	\$ 48,334	\$ 29,131	\$ 36,431
Adjustments to reconcile net income to net cash provided by/(used in) operating activities:			
Provision for credit losses	(9,256)	17,480	5,585
Depreciation and amortization	7,932	8,614	8,368
Deferred tax (benefit)/expense ^(a)	3,748	(3,573)	1,270
Other	3,274	1,649	1,996
Originations and purchases of loans held-for-sale	(347,864)	(166,504)	(169,289)
Proceeds from sales, securitizations and paydowns of loans held-for-sale	336,413	175,490	171,415
Net change in:			
Trading assets	85,710	(148,749)	6,551
Securities borrowed	(45,635)	(20,734)	(27,631)
Accrued interest and accounts receivable	(12,401)	(18,012)	(78)
Other assets ^(a)	(11,745)	(42,430)	(17,777)
Trading liabilities	(23,190)	77,198	(14,516)
Accounts payable and other liabilities ^(a)	43,162	7,415	(466)
Other operating adjustments	(398)	3,115	2,233
Net cash provided by/(used in) operating activities	78,084	(79,910)	4,092
Investing activities			
Net change in:			
Federal funds sold and securities purchased under resale agreements	34,473	(47,115)	72,396
Held-to-maturity securities:			
Proceeds from paydowns and maturities	50,897	21,360	3,423
Purchases	(111,756)	(12,400)	(13,427)
Available-for-sale securities:			
Proceeds from paydowns and maturities	50,075	57,675	52,200
Proceeds from sales	162,748	149,758	70,181
Purchases	(248,785)	(397,145)	(242,149)
Proceeds from sales and securitizations of loans held-for-investment	35,845	23,559	62,095
Other changes in loans, net	(91,797)	(50,263)	(51,743)
All other investing activities, net	(11,044)	(7,341)	(5,035)
Net cash (used in) investing activities	(129,344)	(261,912)	(52,059)
Financing activities			
Net change in:			
Deposits	293,764	602,765	101,002
Federal funds purchased and securities loaned or sold under repurchase agreements	(20,799)	31,528	1,347
Short-term borrowings	7,773	4,438	(28,561)
Beneficial interests issued by consolidated VIEs	(4,254)	1,347	4,289
Proceeds from long-term borrowings	82,409	78,686	61,085
Payments of long-term borrowings	(54,932)	(105,055)	(69,610)
Proceeds from issuance of preferred stock	7,350	4,500	5,000
Redemption of preferred stock	(2,575)	(1,430)	(4,075)
Treasury stock repurchased	(18,408)	(6,517)	(24,001)
Dividends paid	(12,858)	(12,690)	(12,343)
All other financing activities, net	(1,477)	(927)	(1,146)
Net cash provided by financing activities	275,993	596,645	32,987
Effect of exchange rate changes on cash and due from banks and deposits with banks	(11,508)	9,155	(182)
Net increase/(decrease) in cash and due from banks and deposits with banks	213,225	263,978	(15,162)
Cash and due from banks and deposits with banks at the beginning of the period	527,609	263,631	278,793
Cash and due from banks and deposits with banks at the end of the period	\$ 740,834	\$ 527,609	\$ 263,631
Cash interest paid	\$ 5,142	\$ 13,077	\$ 29,918
Cash income taxes paid, net ^(a)	18,737	8,140	6,224

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information on revisions to operating activities.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Note 1 – Basis of presentation

JPMorgan Chase & Co. (“JPMorgan Chase” or the “Firm”), a financial holding company incorporated under Delaware law in 1968, is a leading financial services firm based in the U.S., with operations worldwide. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Refer to Note 32 for a further discussion of the Firm’s business segments.

The accounting and financial reporting policies of JPMorgan Chase and its subsidiaries conform to U.S. GAAP. Additionally, where applicable, the policies conform to the accounting and reporting guidelines prescribed by regulatory authorities.

Certain amounts reported in prior periods have been reclassified to conform with the current presentation. Notably in the first quarter of 2021, the Firm reclassified certain deferred investment tax credits from accounts payable and other liabilities to other assets to be a reduction to the carrying value of the associated tax-oriented investments. Refer to Note 25 for further information.

Consolidation

The Consolidated Financial Statements include the accounts of JPMorgan Chase and other entities in which the Firm has a controlling financial interest. All material intercompany balances and transactions have been eliminated.

Assets held for clients in an agency or fiduciary capacity by the Firm are not assets of JPMorgan Chase and are not included on the Consolidated balance sheets.

The Firm determines whether it has a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity.

Voting interest entities

Voting interest entities are entities that have sufficient equity and provide the equity investors voting rights that enable them to make significant decisions relating to the entity’s operations. For these types of entities, the Firm’s determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which the Firm has a controlling financial interest, through ownership of the majority of the entities’ voting equity interests, or through other contractual rights that give the Firm control, are consolidated by the Firm.

Investments in companies in which the Firm has significant influence over operating and financing decisions (but does not own a majority of the voting equity interests) are accounted for (i) in accordance with the equity method of accounting (which requires the Firm to recognize its proportionate share of the entity’s net earnings), or (ii) at fair value if the fair value option was elected. These investments are generally included in other assets, with income or loss included in noninterest revenue.

Certain Firm-sponsored asset management funds are structured as limited partnerships or limited liability companies. For many of these entities, the Firm is the general partner or managing member, but the non-affiliated partners or members have the ability to remove the Firm as the general partner or managing member without cause (i.e., kick-out rights), based on a simple majority vote, or the non-affiliated partners or members have rights to participate in important decisions. Accordingly, the Firm does not consolidate these voting interest entities. However, in the limited cases where the non-managing partners or members do not have substantive kick-out or participating rights, the Firm evaluates the funds as VIEs and consolidates the funds if the Firm is the general partner or managing member and has both power and a potentially significant interest.

The Firm’s investment companies and asset management funds have investments in both publicly-held and privately-held entities, including investments in buyouts, growth equity and venture opportunities. These investments are accounted for under investment company guidelines and, accordingly, irrespective of the percentage of equity ownership interests held, are carried on the Consolidated balance sheets at fair value, and are recorded in other assets, with income or loss included in noninterest revenue. If consolidated, the Firm retains the accounting under such specialized investment company guidelines.

Variable interest entities

VIEs are entities that, by design, either (1) lack sufficient equity to permit the entity to finance its activities without additional subordinated financial support from other parties, or (2) have equity investors that do not have the ability to make significant decisions relating to the entity’s operations through voting rights, or do not have the obligation to absorb the expected losses, or do not have the right to receive the residual returns of the entity.

The most common type of VIE is an SPE. SPEs are commonly used in securitization transactions in order to isolate certain assets and distribute the cash flows from those assets to investors. The basic SPE structure involves a company selling assets to the SPE; the SPE funds the purchase of those assets by issuing securities to investors. The legal documents that govern the transaction specify how the cash earned on the assets must be allocated to the SPE’s investors and other parties that have rights to those cash flows. SPEs are generally structured to insulate investors from claims on the SPE’s assets by creditors of other entities, including the creditors of the seller of the assets.

The primary beneficiary of a VIE (i.e., the party that has a controlling financial interest) is required to consolidate the assets and liabilities of the VIE. The primary beneficiary is the party that has both (1) the power to direct the activities of the VIE that most significantly impact the VIE’s economic performance; and (2) through its interests in the VIE, the

Notes to consolidated financial statements

obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE.

To assess whether the Firm has the power to direct the activities of a VIE that most significantly impact the VIE's economic performance, the Firm considers all the facts and circumstances, including its role in establishing the VIE and its ongoing rights and responsibilities. This assessment includes, first, identifying the activities that most significantly impact the VIE's economic performance; and second, identifying which party, if any, has power over those activities. In general, the parties that make the most significant decisions affecting the VIE (such as asset managers, collateral managers, servicers, or owners of call options or liquidation rights over the VIE's assets) or have the right to unilaterally remove those decision-makers are deemed to have the power to direct the activities of a VIE.

To assess whether the Firm has the obligation to absorb losses of the VIE or the right to receive benefits from the VIE that could potentially be significant to the VIE, the Firm considers all of its economic interests, including debt and equity investments, servicing fees, and derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that the Firm apply judgment in determining whether these interests, in the aggregate, are considered potentially significant to the VIE. Factors considered in assessing significance include: the design of the VIE, including its capitalization structure; subordination of interests; payment priority; relative share of interests held across various classes within the VIE's capital structure; and the reasons why the interests are held by the Firm.

The Firm performs on-going reassessments of: (1) whether entities previously evaluated under the majority voting-interest framework have become VIEs, based on certain events, and are therefore subject to the VIE consolidation framework; and (2) whether changes in the facts and circumstances regarding the Firm's involvement with a VIE cause the Firm's consolidation conclusion to change.

Refer to Note 14 for further discussion of the Firm's VIEs.

Revenue recognition

Interest income

The Firm recognizes interest income on loans, debt securities, and other debt instruments, generally on a level-yield basis, based on the underlying contractual rate. Refer to Note 7 for further discussion of interest income.

Revenue from contracts with customers

JPMorgan Chase recognizes noninterest revenue from certain contracts with customers, in investment banking fees, deposit-related fees, asset management administration and commissions, and components of card income, when the Firm's related performance obligations are satisfied. Refer to Note 6 for further discussion of the Firm's revenue from contracts with customers.

Principal transactions revenue

JPMorgan Chase carries a portion of its assets and liabilities at fair value. Changes in fair value are reported primarily in principal transactions revenue. Refer to Notes 2 and 3 for further discussion of fair value measurement. Refer to Note 6 for further discussion of principal transactions revenue.

Use of estimates in the preparation of consolidated financial statements

The preparation of the Consolidated Financial Statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenue and expense, and disclosures of contingent assets and liabilities. Actual results could be different from these estimates.

Foreign currency translation

JPMorgan Chase revalues assets, liabilities, revenue and expense denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

Gains and losses relating to translating functional currency financial statements for U.S. reporting are included in the Consolidated statements of comprehensive income. Gains and losses relating to nonfunctional currency transactions, including non-U.S. operations where the functional currency is the U.S. dollar, are reported in the Consolidated statements of income.

Offsetting assets and liabilities

U.S. GAAP permits entities to present derivative receivables and derivative payables with the same counterparty and the related cash collateral receivables and payables on a net basis on the Consolidated balance sheets when a legally enforceable master netting agreement exists. U.S. GAAP also permits securities sold and purchased under repurchase agreements and securities borrowed or loaned under securities loan agreements to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. The Firm has elected to net such balances where it has determined that the specified conditions are met.

The Firm uses master netting agreements to mitigate counterparty credit risk in certain transactions, including derivative contracts, resale, repurchase, securities borrowed and securities loaned agreements. A master netting agreement is a single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due). Upon the exercise of derivatives termination rights by the non-defaulting party (i) all transactions are terminated, (ii) all transactions are valued and the positive values of "in the money" transactions are netted against the negative values of "out of the money" transactions and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount. Upon exercise of default rights under repurchase

agreements and securities loan agreements in general (i) all transactions are terminated and accelerated, (ii) all values of securities or cash held or to be delivered are calculated, and all such sums are netted against each other and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount.

Typical master netting agreements for these types of transactions also often contain a collateral/margin agreement that provides for a security interest in, or title transfer of, securities or cash collateral/margin to the party that has the right to demand margin (the “demanding party”). The collateral/margin agreement typically requires a party to transfer collateral/margin to the demanding party with a value equal to the amount of the margin deficit on a net basis across all transactions governed by the master netting agreement, less any threshold. The collateral/margin agreement grants to the demanding party, upon default by the counterparty, the right to set-off any amounts payable by the counterparty against any posted collateral or the cash equivalent of any posted collateral/margin. It also grants to the demanding party the right to liquidate collateral/margin and to apply the proceeds to an amount payable by the counterparty.

Refer to Note 5 for further discussion of the Firm’s derivative instruments. Refer to Note 11 for further discussion of the Firm’s securities financing agreements.

Statements of cash flows

For JPMorgan Chase’s Consolidated statements of cash flows, cash is defined as those amounts included in cash and due from banks and deposits with banks on the Consolidated balance sheets.

Accounting standard adopted January 1, 2020

Financial Instruments – Credit Losses (“CECL”)

The adoption of this guidance established a single allowance framework for all financial assets measured at amortized cost and certain off-balance sheet credit exposures. This framework requires that management’s estimate reflects credit losses over the instrument’s remaining expected life and considers expected future changes in macroeconomic conditions. Prior to the adoption of the CECL accounting guidance, the Firm’s allowance for credit losses represented management’s estimate of probable credit losses inherent in the Firm’s retained loan portfolios and certain lending-related commitments. The adoption of CECL on January 1, 2020, resulted in a \$2.7 billion decrease to retained earnings.

Notes to consolidated financial statements

Significant accounting policies

The following table identifies JPMorgan Chase's other significant accounting policies and the Note and page where a detailed description of each policy can be found.

Fair value measurement	Note 2	page 169
Fair value option	Note 3	page 190
Derivative instruments	Note 5	page 196
Noninterest revenue and noninterest expense	Note 6	page 211
Interest income and Interest expense	Note 7	page 214
Pension and other postretirement employee benefit plans	Note 8	page 215
Employee share-based incentives	Note 9	page 218
Investment securities	Note 10	page 220
Securities financing activities	Note 11	page 226
Loans	Note 12	page 229
Allowance for credit losses	Note 13	page 248
Variable interest entities	Note 14	page 253
Goodwill and Mortgage servicing rights	Note 15	page 261
Premises and equipment	Note 16	page 265
Leases	Note 18	page 266
Long-term debt	Note 20	page 269
Earnings per share	Note 23	page 274
Income taxes	Note 25	page 277
Off-balance sheet lending-related financial instruments, guarantees and other commitments	Note 28	page 283
Litigation	Note 30	page 290

Note 2 – Fair value measurement

JPMorgan Chase carries a portion of its assets and liabilities at fair value. These assets and liabilities are predominantly carried at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on the Firm's Consolidated balance sheets). Certain assets, liabilities and unfunded lending-related commitments are measured at fair value on a nonrecurring basis; that is, they are not measured at fair value on an ongoing basis but are subject to fair value adjustments only in certain circumstances (for example, when there is evidence of impairment).

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is based on quoted market prices or inputs, where available. If prices or quotes are not available, fair value is based on valuation models and other valuation techniques that consider relevant transaction characteristics (such as maturity) and use, as inputs, observable or unobservable market parameters, including yield curves, interest rates, volatilities, prices (such as commodity, equity or debt prices), correlations, foreign exchange rates and credit curves. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value, as described below.

The level of precision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Firm believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Firm's businesses and portfolios.

The Firm uses various methodologies and assumptions in the determination of fair value. The use of different methodologies or assumptions by other market participants compared with those used by the Firm could result in the Firm deriving a different estimate of fair value at the reporting date.

Valuation process

Risk-taking functions are responsible for providing fair value estimates for assets and liabilities carried on the Consolidated balance sheets at fair value. The Firm's Valuation Control Group ("VCG"), which is part of the Firm's Finance function and independent of the risk-taking functions, is responsible for verifying these estimates and determining any fair value adjustments that may be required to ensure that the Firm's positions are recorded at fair value. In addition, the Firm's Valuation Governance Forum ("VGF"), which is composed of senior finance and risk executives, is responsible for overseeing the management of risks arising from valuation activities conducted across the Firm. The Firmwide VGF is chaired by the Firmwide head of the VCG (under the direction of the Firm's Controller), and includes sub-forums covering the

CIB, CCB, CB, AWM and certain corporate functions including Treasury and CIO.

Price verification process

The VCG verifies fair value estimates provided by the risk-taking functions by leveraging independently derived prices, valuation inputs and other market data, where available. Where independent prices or inputs are not available, the VCG performs additional review to ensure the reasonableness of the estimates. The additional review may include evaluating the limited market activity including client unwinds, benchmarking valuation inputs to those used for similar instruments, decomposing the valuation of structured instruments into individual components, comparing expected to actual cash flows, reviewing profit and loss trends, and reviewing trends in collateral valuation. There are also additional levels of management review for more significant or complex positions.

The VCG determines any valuation adjustments that may be required to the estimates provided by the risk-taking functions. No adjustments to quoted prices are applied for instruments classified within level 1 of the fair value hierarchy (refer to the discussion below for further information on the fair value hierarchy). For other positions, judgment is required to assess the need for valuation adjustments to appropriately reflect liquidity considerations, unobservable parameters, and, for certain portfolios that meet specified criteria, the size of the net open risk position. The determination of such adjustments follows a consistent framework across the Firm:

- Liquidity valuation adjustments are considered where an observable external price or valuation parameter exists but is of lower reliability, potentially due to lower market activity. Liquidity valuation adjustments are made based on current market conditions. Factors that may be considered in determining the liquidity adjustment include analysis of: (1) the estimated bid-offer spread for the instrument being traded; (2) alternative pricing points for similar instruments in active markets; and (3) the range of reasonable values that the price or parameter could take.
- The Firm manages certain portfolios of financial instruments on the basis of net open risk exposure and, as permitted by U.S. GAAP, has elected to estimate the fair value of such portfolios on the basis of a transfer of the entire net open risk position in an orderly transaction. Where this is the case, valuation adjustments may be necessary to reflect the cost of exiting a larger-than-normal market-size net open risk position. Where applied, such adjustments are based on factors that a relevant market participant would consider in the transfer of the net open risk position, including the size of the adverse market move that is likely to occur during the period required to reduce the net open risk position to a normal market-size.
- Uncertainty adjustments related to unobservable parameters may be made when positions are valued

Notes to consolidated financial statements

using prices or input parameters to valuation models that are unobservable due to a lack of market activity or because they cannot be implied from observable market data. Such prices or parameters must be estimated and are, therefore, subject to management judgment. Adjustments are made to reflect the uncertainty inherent in the resulting valuation estimate.

- Where appropriate, the Firm also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality (CVA), the Firm's own creditworthiness (DVA) and the impact of funding (FVA), using a consistent framework across the Firm. Refer to Credit and funding adjustments on page 186 of this Note for more information on such adjustments.

Valuation model review and approval

If prices or quotes are not available for an instrument or a similar instrument, fair value is generally determined using valuation models that consider relevant transaction terms such as maturity and use as inputs market-based or independently sourced parameters. Where this is the case the price verification process described above is applied to the inputs in those models.

Under the Firm's Estimations and Model Risk Management Policy, the MRGR reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances exceptions may be granted to the Firm's policy to allow a model to be used prior to review or approval. The MRGR may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

Fair value hierarchy

A three-level fair value hierarchy has been established under U.S. GAAP for disclosure of fair value measurements. The fair value hierarchy is based on the observability of inputs to the valuation of an asset or liability as of the measurement date. The three levels are defined as follows.

- Level 1 - inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2 - inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.
- Level 3 - one or more inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's categorization within the fair value hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The following table describes the valuation methodologies generally used by the Firm to measure its significant products/instruments at fair value, including the general classification of such instruments pursuant to the fair value hierarchy.

Product/instrument	Valuation methodology	Classifications in the fair value hierarchy
Securities financing agreements	Valuations are based on discounted cash flows, which consider: <ul style="list-style-type: none"> • Derivative features: refer to the discussion of derivatives below for further information. • Market rates for the respective maturity • Collateral characteristics 	Predominantly level 2
Loans and lending-related commitments – wholesale Loans carried at fair value (trading loans and non-trading loans) and associated lending-related commitments	Where observable market data is available, valuations are based on: <ul style="list-style-type: none"> • Observed market prices (circumstances are infrequent) • Relevant broker quotes • Observed market prices for similar instruments Where observable market data is unavailable or limited, valuations are based on discounted cash flows, which consider the following: <ul style="list-style-type: none"> • Credit spreads derived from the cost of CDS; or benchmark credit curves developed by the Firm, by industry and credit rating • Prepayment speed • Collateral characteristics 	Level 2 or 3
Loans – consumer Loans carried at fair value – conforming residential mortgage loans expected to be sold	Fair value is based on observable market prices for mortgage-backed securities with similar collateral and incorporates adjustments to these prices to account for differences between the securities and the value of the underlying loans, which include credit characteristics, portfolio composition, and liquidity.	Predominantly level 2
Investment and trading securities	Quoted market prices	Level 1
	In the absence of quoted market prices, securities are valued based on: <ul style="list-style-type: none"> • Observable market prices for similar securities • Relevant broker quotes • Discounted cash flows In addition, the following inputs to discounted cash flows are used for the following products: Mortgage- and asset-backed securities specific inputs: <ul style="list-style-type: none"> • Collateral characteristics • Deal-specific payment and loss allocations • Current market assumptions related to yield, prepayment speed, conditional default rates and loss severity Collateralized loan obligations (“CLOs”) specific inputs: <ul style="list-style-type: none"> • Collateral characteristics • Deal-specific payment and loss allocations • Expected prepayment speed, conditional default rates, loss severity • Credit spreads • Credit rating data 	Level 2 or 3
Physical commodities	Valued using observable market prices or data.	Level 1 or 2

Notes to consolidated financial statements

Product/instrument	Valuation methodology	Classifications in the fair value hierarchy
Derivatives	Exchange-traded derivatives that are actively traded and valued using the exchange price.	Level 1
	<p>Derivatives that are valued using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs as well as considering the contractual terms.</p> <p>The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, foreign exchange rates, volatilities, correlations, CDS spreads and recovery rates.</p> <p>In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows:</p> <p>Interest rate and FX exotic options specific inputs include:</p> <ul style="list-style-type: none"> • Interest rate volatility • Interest rate spread volatility • Interest rate correlation • Interest rate-FX correlation • Foreign exchange correlation • Interest rate curve <p>Structured credit derivatives specific inputs include:</p> <ul style="list-style-type: none"> • Credit correlation between the underlying debt instruments • CDS spreads and recovery rates <p>Equity option specific inputs include:</p> <ul style="list-style-type: none"> • Forward equity price • Equity volatility • Equity correlation • Equity-FX correlation • Equity-IR correlation <p>Commodity derivatives specific inputs include:</p> <ul style="list-style-type: none"> • Forward commodity price • Commodity volatility • Commodity correlation <p>Additionally, adjustments are made to reflect counterparty credit quality (CVA) and the impact of funding (FVA). Refer to page 186 of this Note.</p>	Level 2 or 3
Mortgage servicing rights	Refer to Mortgage servicing rights in Note 15.	Level 3
Private equity direct investments	<p>Fair value is estimated using all available information; the range of potential inputs include:</p> <ul style="list-style-type: none"> • Transaction prices • Trading multiples of comparable public companies • Operating performance of the underlying portfolio company • Adjustments as required, since comparable public companies are not identical to the company being valued, and for company-specific issues and lack of liquidity. • Additional available inputs relevant to the investment. 	Level 2 or 3
Fund investments (e.g., mutual/collective investment funds, private equity funds, hedge funds, and real estate funds)	Net asset value	Level 1
	<ul style="list-style-type: none"> • NAV is supported by the ability to redeem and purchase at the NAV level. • Adjustments to the NAV as required, for restrictions on redemption (e.g., lock-up periods or withdrawal limitations) or where observable activity is limited. 	Level 2 or 3 ^(a)
Beneficial interests issued by consolidated VIEs	<p>Valued using observable market information, where available.</p> <p>In the absence of observable market information, valuations are based on the fair value of the underlying assets held by the VIE.</p>	Level 2 or 3

(a) Excludes certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient.

Product/instrument	Valuation methodology	Classification in the fair value hierarchy
Structured notes (included in deposits, short-term borrowings and long-term debt)	<ul style="list-style-type: none"> • Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note. • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion above regarding derivatives valuation. Adjustments are then made to this base valuation to reflect the Firm's own credit risk (DVA). Refer to page 186 of this Note. 	Level 2 or 3

Notes to consolidated financial statements

The following table presents the assets and liabilities reported at fair value as of December 31, 2021 and 2020, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

December 31, 2021 (in millions)	Fair value hierarchy			Derivative netting adjustments ^(f)	Total fair value
	Level 1	Level 2	Level 3		
Federal funds sold and securities purchased under resale agreements	\$ —	\$ 252,720	\$ —	\$ —	\$ 252,720
Securities borrowed	—	81,463	—	—	81,463
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies ^(a)	—	38,944	265	—	39,209
Residential - nonagency	—	2,358	28	—	2,386
Commercial - nonagency	—	1,506	10	—	1,516
Total mortgage-backed securities	—	42,808	303	—	43,111
U.S. Treasury, GSEs and government agencies ^(a)	68,527	9,181	—	—	77,708
Obligations of U.S. states and municipalities	—	7,068	7	—	7,075
Certificates of deposit, bankers' acceptances and commercial paper	—	852	—	—	852
Non-U.S. government debt securities	26,982	44,581	81	—	71,644
Corporate debt securities	—	24,491	332	—	24,823
Loans	—	7,366	708	—	8,074
Asset-backed securities	—	2,668	26	—	2,694
Total debt instruments	95,509	139,015	1,457	—	235,981
Equity securities	86,904	1,741	662	—	89,307
Physical commodities ^(b)	5,357	20,788	—	—	26,145
Other	—	24,850	160	—	25,010
Total debt and equity instruments^(c)	187,770	186,394	2,279	—	376,443
Derivative receivables:					
Interest rate	1,072	267,493	2,020	(248,611)	21,974
Credit	—	9,321	518	(8,808)	1,031
Foreign exchange	134	168,590	855	(156,954)	12,625
Equity	—	65,139	3,492	(58,650)	9,981
Commodity	—	26,232	421	(15,183)	11,470
Total derivative receivables	1,206	536,775	7,306	(488,206)	57,081
Total trading assets^(d)	188,976	723,169	9,585	(488,206)	433,524
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies ^(a)	4	72,539	—	—	72,543
Residential - nonagency	—	6,070	—	—	6,070
Commercial - nonagency	—	4,949	—	—	4,949
Total mortgage-backed securities	4	83,558	—	—	83,562
U.S. Treasury and government agencies	177,463	—	—	—	177,463
Obligations of U.S. states and municipalities	—	15,860	—	—	15,860
Non-U.S. government debt securities	5,430	10,779	—	—	16,209
Corporate debt securities	—	160	161	—	321
Asset-backed securities:					
Collateralized loan obligations	—	9,662	—	—	9,662
Other	—	5,448	—	—	5,448
Total available-for-sale securities	182,897	125,467	161	—	308,525
Loans ^(e)	—	56,887	1,933	—	58,820
Mortgage servicing rights	—	—	5,494	—	5,494
Other assets ^(f)	9,558	4,139	306	—	14,003
Total assets measured at fair value on a recurring basis	\$ 381,431	\$ 1,243,845	\$ 17,479	\$ (488,206)	\$ 1,154,549
Deposits	\$ —	\$ 9,016	\$ 2,317	\$ —	\$ 11,333
Federal funds purchased and securities loaned or sold under repurchase agreements	—	126,435	—	—	126,435
Short-term borrowings	—	17,534	2,481	—	20,015
Trading liabilities:					
Debt and equity instruments ^(c)	87,831	26,716	30	—	114,577
Derivative payables:					
Interest rate	981	237,714	2,036	(232,537)	8,194
Credit	—	10,468	444	(10,032)	880
Foreign exchange	123	174,349	1,274	(161,649)	14,097
Equity	—	72,609	7,118	(62,494)	17,233
Commodity	—	26,600	1,328	(18,216)	9,712
Total derivative payables	1,104	521,740	12,200	(484,928)	50,116
Total trading liabilities	88,935	548,456	12,230	(484,928)	164,693
Accounts payable and other liabilities	5,115	467	69	—	5,651
Beneficial interests issued by consolidated VIEs	—	12	—	—	12
Long-term debt	—	50,560	24,374	—	74,934
Total liabilities measured at fair value on a recurring basis	\$ 94,050	\$ 752,480	\$ 41,471	\$ (484,928)	\$ 403,073

December 31, 2020 (in millions)	Fair value hierarchy			Derivative netting adjustments ^(f)	Total fair value
	Level 1	Level 2	Level 3		
Federal funds sold and securities purchased under resale agreements	\$ —	\$ 238,015	\$ —	\$ —	\$ 238,015
Securities borrowed	—	52,983	—	—	52,983
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies ^(a)	—	68,395	449	—	68,844
Residential - nonagency	—	2,138	28	—	2,166
Commercial - nonagency	—	1,327	3	—	1,330
Total mortgage-backed securities	—	71,860	480	—	72,340
U.S. Treasury, GSEs and government agencies ^(a)	104,263	10,996	—	—	115,259
Obligations of U.S. states and municipalities	—	7,184	8	—	7,192
Certificates of deposit, bankers' acceptances and commercial paper	—	1,230	—	—	1,230
Non-U.S. government debt securities	26,772	40,671	182	—	67,625
Corporate debt securities	—	21,017	507	—	21,524
Loans	—	6,101	893	—	6,994
Asset-backed securities	—	2,304	28	—	2,332
Total debt instruments	131,035	161,363	2,098	—	294,496
Equity securities	97,035	2,652	476 ^(g)	—	100,163
Physical commodities ^(b)	6,382	5,189	—	—	11,571
Other	—	21,351 ^(g)	49 ^(g)	—	21,400
Total debt and equity instruments^(c)	234,452	190,555	2,623	—	427,630
Derivative receivables:					
Interest rate ^(g)	2,318	387,023	2,307	(355,923)	35,725
Credit ^(g)	—	12,721	624	(12,665)	680
Foreign exchange	146	205,127	987	(190,479)	15,781
Equity	—	67,093 ^(g)	3,519	(54,125)	16,487
Commodity	—	21,272	231	(14,732)	6,771
Total derivative receivables	2,464	693,236	7,668	(627,924)	75,444
Total trading assets^(d)	236,916	883,791	10,291	(627,924)	503,074
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies ^{(a)(g)}	7	113,294	—	—	113,301
Residential - nonagency	—	10,233	—	—	10,233
Commercial - nonagency	—	2,856	—	—	2,856
Total mortgage-backed securities	7	126,383	—	—	126,390
U.S. Treasury and government agencies	201,951	—	—	—	201,951
Obligations of U.S. states and municipalities	—	20,396	—	—	20,396
Non-U.S. government debt securities	13,135	9,793	—	—	22,928
Corporate debt securities	—	216	—	—	216
Asset-backed securities:					
Collateralized loan obligations	—	10,048	—	—	10,048
Other	—	6,249	—	—	6,249
Total available-for-sale securities	215,093	173,085	—	—	388,178
Loans ^(e)	—	42,169	2,305	—	44,474
Mortgage servicing rights	—	—	3,276	—	3,276
Other assets ^(d)	8,110	4,561	538	—	13,209
Total assets measured at fair value on a recurring basis	\$ 460,119	\$ 1,394,604	\$ 16,410	\$ (627,924)	\$ 1,243,209
Deposits	\$ —	\$ 11,571	\$ 2,913	\$ —	\$ 14,484
Federal funds purchased and securities loaned or sold under repurchase agreements	—	155,735	—	—	155,735
Short-term borrowings	—	14,473	2,420	—	16,893
Trading liabilities:					
Debt and equity instruments ^(c)	82,669	16,838	51	—	99,558
Derivative payables:					
Interest rate ^(g)	2,496	349,442	2,049	(340,975)	13,012
Credit ^(g)	—	13,984	848	(12,837)	1,995
Foreign exchange	132	214,373	1,421	(194,493)	21,433
Equity	—	74,032	7,381	(55,515)	25,898
Commodity	—	21,767	962	(14,444)	8,285
Total derivative payables	2,628	673,598	12,661	(618,264)	70,623
Total trading liabilities	85,297	690,436	12,712	(618,264)	170,181
Accounts payable and other liabilities	2,895	513	68	—	3,476
Beneficial interests issued by consolidated VIEs	—	41	—	—	41
Long-term debt	—	53,420	23,397	—	76,817
Total liabilities measured at fair value on a recurring basis	\$ 88,192	\$ 926,189	\$ 41,510	\$ (618,264)	\$ 437,627

- (a) At December 31, 2021 and 2020, included total U.S. GSE obligations of \$73.9 billion and \$117.6 billion, respectively, which were mortgage-related.
- (b) Physical commodities inventories are generally accounted for at the lower of cost or net realizable value. "Net realizable value" is a term defined in U.S. GAAP as not exceeding fair value less costs to sell ("transaction costs"). Transaction costs for the Firm's physical commodities inventories are either not applicable or immaterial to the value of the inventory. Therefore, net realizable value approximates fair value for the Firm's physical commodities inventories. When fair value hedging has been applied (or when net realizable value is below cost), the carrying value of physical commodities approximates fair value, because under fair value hedge accounting, the cost basis is adjusted for changes in fair value. Refer to Note 5 for a further discussion of the Firm's hedge accounting relationships. To provide consistent fair value disclosure information, all physical commodities inventories have been included in each period presented.
- (c) Balances reflect the reduction of securities owned (long positions) by the amount of identical securities sold but not yet purchased (short positions).

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- (d) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not required to be classified in the fair value hierarchy. At December 31, 2021 and 2020, the fair values of these investments, which include certain hedge funds, private equity funds, real estate and other funds, were \$801 million and \$670 million, respectively. Included in these balances at December 31, 2021 and 2020, were trading assets of \$51 million and \$52 million, respectively, and other assets of \$750 million and \$618 million, respectively.
- (e) At December 31, 2021 and 2020, included \$26.2 billion and \$15.1 billion, respectively, of residential first-lien mortgages, and \$8.2 billion and \$6.3 billion, respectively, of commercial first-lien mortgages. Residential mortgage loans include conforming mortgage loans originated with the intent to sell to U.S. GSEs and government agencies of \$13.6 billion and \$8.4 billion, respectively.
- (f) As permitted under U.S. GAAP, the Firm has elected to net derivative receivables and derivative payables and the related cash collateral received and paid when a legally enforceable master netting agreement exists. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral.
- (g) Prior-period amounts have been revised to conform with the current presentation.

Level 3 valuations

The Firm has established well-structured processes for determining fair value, including for instruments where fair value is estimated using significant unobservable inputs (level 3). Refer to pages 169-173 of this Note for further information on the Firm's valuation process and a detailed discussion of the determination of fair value for individual financial instruments.

Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Firm. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, due to the lack of observability of significant inputs, management must assess relevant empirical data in deriving valuation inputs including transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents the Firm's primary level 3 financial instruments, the valuation techniques used to measure the fair value of those financial instruments, the significant unobservable inputs, the range of values for those inputs and the weighted or arithmetic averages of such inputs. While the determination to classify an instrument within level 3 is based on the significance of the unobservable inputs to the overall fair value measurement, level 3 financial instruments typically include observable components (that is, components that are actively quoted and can be validated to external sources) in addition to the unobservable components. The level 1 and/or level 2 inputs are not included in the table. In addition, the Firm manages the risk of the observable components of level 3 financial instruments using securities and derivative positions that are classified within levels 1 or 2 of the fair value hierarchy.

The range of values presented in the table is representative of the highest and lowest level input used to value the significant groups of instruments within a product/instrument classification. Where provided, the weighted averages of the input values presented in the table are calculated based on the fair value of the instruments that the input is being used to value.

In the Firm's view, the input range, weighted and arithmetic average values do not reflect the degree of input uncertainty or an assessment of the reasonableness of the Firm's estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Firm and the relative distribution of instruments within the range of characteristics. For example, two option contracts may have similar levels of market risk exposure and valuation uncertainty, but may have significantly different implied volatility levels because the option contracts have different underlyings, tenors, or strike prices. The input range and weighted average values will therefore vary from period-to-period and parameter-to-parameter based on the characteristics of the instruments held by the Firm at each balance sheet date.

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Level 3 inputs^(a)

December 31, 2021

Product/Instrument	Fair value (in millions)	Principal valuation technique	Unobservable inputs ^(g)	Range of input values	Average ⁽ⁱ⁾
Residential mortgage-backed securities and loans ^(b)	\$ 1,181	Discounted cash flows	Yield	0% - 15%	4%
			Prepayment speed	0% - 15%	14%
			Conditional default rate	0% - 2%	0%
			Loss severity	0% - 110%	4%
Commercial mortgage-backed securities and loans ^(c)	391	Market comparables	Price	\$0 - \$103	\$84
Corporate debt securities	493	Market comparables	Price	\$0 - \$154	\$87
Loans ^(d)	1,372	Market comparables	Price	\$5 - \$107	\$89
Non-U.S. government debt securities	81	Market comparables	Price	\$87 - \$103	\$96
Net interest rate derivatives	(26)	Option pricing	Interest rate volatility	5bps - 544bps	106bps
			Interest rate spread volatility	11bps - 23bps	14bps
			Interest rate correlation	(65)% - 87%	25%
			IR-FX correlation	(35)% - 50%	(2)%
	10	Discounted cash flows	Prepayment speed	0% - 30%	8%
Net credit derivatives	26	Discounted cash flows	Credit correlation	35% - 65%	46%
			Credit spread	1bps - 4,396bps	384bps
			Recovery rate	35% - 67%	51%
	48	Market comparables	Price	\$0 - \$115	\$80
Net foreign exchange derivatives	(320)	Option pricing	IR-FX correlation	(40)% - 65%	17%
	(99)	Discounted cash flows	Prepayment speed	9%	9%
			Interest rate curve	0% - 28%	4%
Net equity derivatives	(3,626)	Option pricing	Forward equity price ^(h)	63% - 122%	99%
			Equity volatility	4% - 132%	32%
			Equity correlation	17% - 100%	55%
			Equity-FX correlation	(79)% - 59%	(27)%
			Equity-IR correlation	15% - 50%	27%
Net commodity derivatives	(907)	Option pricing	Oil commodity forward	\$631 / MT - \$747 / MT	\$689 / MT
			Industrial metals commodity forward	\$2,610 / MT - \$3,482 / MT	\$3,046 / MT
			Commodity volatility	5% - 185%	95%
			Commodity correlation	(50)% - 76%	13%
MSRs	5,494	Discounted cash flows	Refer to Note 15		
Long-term debt, short-term borrowings, and deposits ^(e)	28,236	Option pricing	Interest rate volatility	5bps - 544bps	106bps
			Interest rate correlation	(65)% - 87%	25%
			IR-FX correlation	(35)% - 50%	(2)%
			Equity correlation	17% - 100%	55%
			Equity-FX correlation	(79)% - 59%	(27)%
			Equity-IR correlation	15% - 50%	27%
	936	Discounted cash flows	Credit correlation	35% - 65%	46%
Other level 3 assets and liabilities, net ^(f)	1,062				

- (a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated balance sheets. Furthermore, the inputs presented for each valuation technique in the table are, in some cases, not applicable to every instrument valued using the technique as the characteristics of the instruments can differ.
- (b) Comprises U.S. GSE and government agency securities of \$265 million, nonagency securities of \$28 million and non-trading loans of \$888 million.
- (c) Comprises nonagency securities of \$10 million, trading loans of \$40 million and non-trading loans of \$341 million.
- (d) Comprises trading loans of \$668 million and non-trading loans of \$704 million.
- (e) Long-term debt, short-term borrowings and deposits include structured notes issued by the Firm that are financial instruments that typically contain embedded derivatives. The estimation of the fair value of structured notes includes the derivative features embedded within the instrument. The significant unobservable inputs are broadly consistent with those presented for derivative receivables.
- (f) Includes equity securities of \$806 million including \$144 million in Other assets, for which quoted prices are not readily available and the fair value is generally based on internal valuation techniques such as EBITDA multiples and comparable analysis. All other level 3 assets and liabilities are insignificant both individually and in aggregate.
- (g) Price is a significant unobservable input for certain instruments. When quoted market prices are not readily available, reliance is generally placed on price-based internal valuation techniques. The price input is expressed assuming a par value of \$100.
- (h) Forward equity price is expressed as a percentage of the current equity price.
- (i) Amounts represent weighted averages except for derivative-related inputs where arithmetic averages are used.

Changes in and ranges of unobservable inputs

The following discussion provides a description of the impact on a fair value measurement of a change in each unobservable input in isolation, and the interrelationship between unobservable inputs, where relevant and significant. The impact of changes in inputs may not be independent, as a change in one unobservable input may give rise to a change in another unobservable input. Where relationships do exist between two unobservable inputs, those relationships are discussed below. Relationships may also exist between observable and unobservable inputs (for example, as observable interest rates rise, unobservable prepayment rates decline); such relationships have not been included in the discussion below. In addition, for each of the individual relationships described below, the inverse relationship would also generally apply.

The following discussion also provides a description of attributes of the underlying instruments and external market factors that affect the range of inputs used in the valuation of the Firm's positions.

Yield - The yield of an asset is the interest rate used to discount future cash flows in a discounted cash flow calculation. An increase in the yield, in isolation, would result in a decrease in a fair value measurement.

Credit spread - The credit spread is the amount of additional annualized return over the market interest rate that a market participant would demand for taking exposure to the credit risk of an instrument. The credit spread for an instrument forms part of the discount rate used in a discounted cash flow calculation. Generally, an increase in the credit spread would result in a decrease in a fair value measurement.

The yield and the credit spread of a particular mortgage-backed security primarily reflect the risk inherent in the instrument. The yield is also impacted by the absolute level of the coupon paid by the instrument (which may not correspond directly to the level of inherent risk). Therefore, the range of yield and credit spreads reflects the range of risk inherent in various instruments owned by the Firm. The risk inherent in mortgage-backed securities is driven by the subordination of the security being valued and the characteristics of the underlying mortgages within the collateralized pool, including borrower FICO scores, LTV ratios for residential mortgages and the nature of the property and/or any tenants for commercial mortgages. For corporate debt securities, obligations of U.S. states and municipalities and other similar instruments, credit spreads reflect the credit quality of the obligor and the tenor of the obligation.

Prepayment speed - The prepayment speed is a measure of the voluntary unscheduled principal repayments of a prepayable obligation in a collateralized pool. Prepayment speeds generally decline as borrower delinquencies rise. An increase in prepayment speeds, in isolation, would result in a decrease in a fair value measurement of assets valued at a premium to par and an increase in a fair value measurement of assets valued at a discount to par.

Prepayment speeds may vary from collateral pool to collateral pool, and are driven by the type and location of the underlying borrower, and the remaining tenor of the obligation as well as the level and type (e.g., fixed or floating) of interest rate being paid by the borrower. Typically collateral pools with higher borrower credit quality have a higher prepayment rate than those with lower borrower credit quality, all other factors being equal.

Conditional default rate - The conditional default rate is a measure of the reduction in the outstanding collateral balance underlying a collateralized obligation as a result of defaults. While there is typically no direct relationship between conditional default rates and prepayment speeds, collateralized obligations for which the underlying collateral has high prepayment speeds will tend to have lower conditional default rates. An increase in conditional default rates would generally be accompanied by an increase in loss severity and an increase in credit spreads. An increase in the conditional default rate, in isolation, would result in a decrease in a fair value measurement. Conditional default rates reflect the quality of the collateral underlying a securitization and the structure of the securitization itself. Based on the types of securities owned in the Firm's market-making portfolios, conditional default rates are most typically at the lower end of the range presented.

Loss severity - The loss severity (the inverse concept is the recovery rate) is the expected amount of future realized losses resulting from the ultimate liquidation of a particular loan, expressed as the net amount of loss relative to the outstanding loan balance. An increase in loss severity is generally accompanied by an increase in conditional default rates. An increase in the loss severity, in isolation, would result in a decrease in a fair value measurement.

The loss severity applied in valuing a mortgage-backed security investment depends on factors relating to the underlying mortgages, including the LTV ratio, the nature of the lender's lien on the property and other instrument-specific factors.

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Correlation – Correlation is a measure of the relationship between the movements of two variables. Correlation is a pricing input for a derivative product where the payoff is driven by one or more underlying risks. Correlation inputs are related to the type of derivative (e.g., interest rate, credit, equity, foreign exchange and commodity) due to the nature of the underlying risks. When parameters are positively correlated, an increase in one parameter will result in an increase in the other parameter. When parameters are negatively correlated, an increase in one parameter will result in a decrease in the other parameter. An increase in correlation can result in an increase or a decrease in a fair value measurement. Given a short correlation position, an increase in correlation, in isolation, would generally result in a decrease in a fair value measurement.

The level of correlation used in the valuation of derivatives with multiple underlying risks depends on a number of factors including the nature of those risks. For example, the correlation between two credit risk exposures would be different than that between two interest rate risk exposures. Similarly, the tenor of the transaction may also impact the correlation input, as the relationship between the underlying risks may be different over different time periods. Furthermore, correlation levels are very much dependent on market conditions and could have a relatively wide range of levels within or across asset classes over time, particularly in volatile market conditions.

Volatility – Volatility is a measure of the variability in possible returns for an instrument, parameter or market index given how much the particular instrument, parameter or index changes in value over time. Volatility is a pricing input for options, including equity options, commodity options, and interest rate options. Generally, the higher the volatility of the underlying, the riskier the instrument. Given a long position in an option, an increase in volatility, in isolation, would generally result in an increase in a fair value measurement.

The level of volatility used in the valuation of a particular option-based derivative depends on a number of factors, including the nature of the risk underlying the option (e.g., the volatility of a particular equity security may be significantly different from that of a particular commodity index), the tenor of the derivative as well as the strike price of the option.

Interest rate curve – represents the relationship of interest rates over differing tenors. The interest rate curve is used to set interest rate and foreign exchange derivative cash flows and is also a pricing input used in the discounting of any derivative cash flow.

Forward price - Forward price is the price at which the buyer agrees to purchase the asset underlying a forward contract on the predetermined future delivery date, and is such that the value of the contract is zero at inception.

The forward price is used as an input in the valuation of certain derivatives and depends on a number of factors including interest rates, the current price of the underlying asset, and the expected income to be received and costs to be incurred by the seller as a result of holding that asset until the delivery date. An increase in the forward can result in an increase or a decrease in a fair value measurement.

Changes in level 3 recurring fair value measurements

The following tables include a rollforward of the Consolidated balance sheets amounts (including changes in fair value) for financial instruments classified by the Firm within level 3 of the fair value hierarchy for the years ended December 31, 2021, 2020 and 2019. When a determination is made to classify a financial instrument within level 3, the determination is based on the significance of the unobservable inputs to the overall fair value measurement. However, level 3 financial instruments typically include, in addition to the unobservable or level 3 components, observable components (that is, components that are actively quoted and can be validated to external sources); accordingly, the gains and losses in the table below include changes in fair value due in part to observable factors that are part of the valuation methodology. Also, the Firm risk-manages the observable components of level 3 financial instruments using securities and derivative positions that are classified within level 1 or 2 of the fair value hierarchy; as these level 1 and level 2 risk management instruments are not included below, the gains or losses in the following tables do not reflect the effect of the Firm's risk management activities related to such level 3 instruments.

Year ended December 31, 2021 (in millions)	Fair value measurements using significant unobservable inputs							Fair value at Dec. 31, 2021	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2021
	Fair value at January 1, 2021	Total realized/ unrealized gains/(losses)	Purchases ^(f)	Sales	Settlements ^(g)	Transfers into level 3	Transfers (out of) level 3		
Assets: ^(a)									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	\$ 449	\$ (28)	\$ 21	\$ (67)	\$ (110)	\$ 1	\$ (1)	\$ 265	\$ (31)
Residential - nonagency	28	—	26	(24)	(5)	4	(1)	28	(3)
Commercial - nonagency	3	5	12	(7)	(17)	14	—	10	(2)
Total mortgage-backed securities	480	(23)	59	(98)	(132)	19	(2)	303	(36)
Obligations of U.S. states and municipalities	8	—	—	—	(1)	—	—	7	—
Non-U.S. government debt securities	182	(14)	359	(332)	(7)	—	(107)	81	(10)
Corporate debt securities	507	(23)	404	(489)	(4)	162	(225)	332	(16)
Loans	893	2	994	(669)	(287)	648	(873)	708	(20)
Asset-backed securities	28	28	76	(99)	(2)	2	(7)	26	(2)
Total debt instruments	2,098	(30)	1,892	(1,687)	(433)	831	(1,214)	1,457	(84)
Equity securities	476	(77)	378	(168)	—	164	(111)	662	(335)
Other	49	74	233	—	(98)	5	(103)	160	31
Total trading assets - debt and equity instruments	2,623	(33) ^(c)	2,503	(1,855)	(531)	1,000	(1,428)	2,279	(388) ^(c)
Net derivative receivables: ^(b)									
Interest rate	258	1,789	116	(192)	(2,011)	112	(88)	(16)	282
Credit	(224)	130	6	(12)	146	34	(6)	74	141
Foreign exchange	(434)	(209)	110	(110)	222	(12)	14	(419)	13
Equity	(3,862)	(480)	1,285	(2,813)	1,758	315	171	(3,626)	(155)
Commodity	(731)	(728)	145	(493)	916	(4)	(12)	(907)	(426)
Total net derivative receivables	(4,993)	502 ^(c)	1,662	(3,620)	1,031	445	79	(4,894)	(145) ^(c)
Available-for-sale securities:									
Mortgage-backed securities	—	—	—	—	—	—	—	—	—
Corporate debt securities	—	(1)	162	—	—	—	—	161	(1)
Total available-for-sale securities	—	(1)	162	—	—	—	—	161	(1)
Loans	2,305	(87) ^(c)	612	(439)	(965)	1,301	(794)	1,933	(59) ^(c)
Mortgage servicing rights	3,276	98 ^(d)	3,022	(114)	(788)	—	—	5,494	98 ^(d)
Other assets	538	16 ^(c)	9	(17)	(239)	—	(1)	306	11 ^(c)

Year ended December 31, 2021 (in millions)	Fair value measurements using significant unobservable inputs							Fair value at Dec. 31, 2021	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2021	
	Fair value at January 1, 2021	Total realized/ unrealized gains/(losses)	Purchases	Sales	Issuances	Settlements ^(g)	Transfers into level 3			Transfers (out of) level 3
Liabilities: ^(a)										
Deposits	\$ 2,913	\$ (80) ^{(c)(e)}	\$ —	\$ —	\$ 431	\$ (467)	\$ 2	\$ (482)	\$ 2,317	\$ (77) ^{(c)(e)}
Short-term borrowings	2,420	(1,391) ^{(c)(e)}	—	—	6,823	(5,308)	9	(72)	2,481	(83) ^{(c)(e)}
Trading liabilities - debt and equity instruments	51	(8) ^(c)	(101)	38	—	—	64	(14)	30	(157) ^(c)
Accounts payable and other liabilities	68	8 ^(c)	—	1	—	—	—	(8)	69	8 ^(c)
Beneficial interests issued by consolidated VIEs	—	—	—	—	—	—	—	—	—	—
Long-term debt	23,397	369 ^{(c)(e)}	—	—	13,505	(12,191)	103	(809)	24,374	87 ^{(c)(e)}

Notes to consolidated financial statements

Year ended December 31, 2020 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2020	
	Fair value at January 1, 2020	Total realized/ unrealized gains/ (losses)	Purchases ^(f)	Sales	Settlements ^(g)	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2020		
Assets:^(a)										
Trading assets:										
Debt instruments:										
Mortgage-backed securities:										
U.S. GSEs and government agencies	\$ 797	\$ (172)	\$ 134	\$ (149)	\$ (161)	\$ —	\$ —	\$ 449	\$ (150)	
Residential - nonagency	23	2	15	(5)	(4)	—	(3)	28	(1)	
Commercial - nonagency	4	—	1	—	(1)	2	(3)	3	—	
Total mortgage-backed securities	824	(170)	150	(154)	(166)	2	(6)	480	(151)	
Obligations of U.S. states and municipalities	10	—	—	(1)	(1)	—	—	8	—	
Non-U.S. government debt securities	155	21	281	(245)	(7)	—	(23)	182	11	
Corporate debt securities	558	(23)	582	(205)	(236)	411	(580)	507	(25)	
Loans	673	(73)	1,112	(484)	(182)	791	(944)	893	(40)	
Asset-backed securities	37	(3)	44	(40)	(9)	9	(10)	28	(4)	
Total debt instruments	2,257	(248)	2,169	(1,129)	(601)	1,213	(1,563)	2,098	(209)	
Equity securities ^(h)	196	(137)	412	(376)	(1)	535	(153)	476	(82)	
Other ^(h)	232	333	229	(9)	(497)	6	(245)	49	268	
Total trading assets - debt and equity instruments	2,685	(52) ^(c)	2,810	(1,514)	(1,099)	1,754	(1,961)	2,623	(23) ^(c)	
Net derivative receivables: ^(b)										
Interest rate	(332)	2,682	308	(148)	(2,228)	(332)	308	258	325	
Credit	(139)	(212)	73	(154)	181	59	(32)	(224)	(110)	
Foreign exchange	(607)	49	49	(24)	83	13	3	(434)	116	
Equity	(3,395)	(65)	1,664	(2,317)	1,162	(935)	24	(3,862)	(556)	
Commodity	(16)	(546)	27	(241)	356	(310)	(1)	(731)	267	
Total net derivative receivables	(4,489)	1,908 ^(c)	2,121	(2,884)	(446)	(1,505)	302	(4,993)	42 ^(c)	
Available-for-sale securities:										
Mortgage-backed securities	1	—	—	—	(1)	—	—	—	—	
Corporate debt securities	—	—	—	—	—	—	—	—	—	
Total available-for-sale securities	1	—	—	—	(1)	—	—	—	—	
Loans	516	(243) ^(c)	962	(84)	(733)	2,571	(684)	2,305	(18) ^(c)	
Mortgage servicing rights	4,699	(1,540) ^(d)	1,192	(176)	(899)	—	—	3,276	(1,540) ^(d)	
Other assets	917	(63) ^(c)	75	(104)	(320)	40	(7)	538	(3) ^(c)	

Year ended December 31, 2020 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2020	
	Fair value at January 1, 2020	Total realized/ unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements ^(g)	Transfers into level 3	Transfers (out of) level 3		Fair value at Dec. 31, 2020
Liabilities:^(a)										
Deposits	\$ 3,360	\$ 165 ^{(c)(e)}	\$ —	\$ —	\$ 671	\$ (605)	\$ 265	\$ (943)	\$ 2,913	\$ 455 ^{(c)(e)}
Short-term borrowings	1,674	(338) ^{(c)(e)}	—	—	5,140	(4,115)	105	(46)	2,420	143 ^{(c)(e)}
Trading liabilities - debt and equity instruments	41	(2) ^(c)	(126)	14	—	(4)	136	(8)	51	(1) ^(c)
Accounts payable and other liabilities	45	33 ^(c)	(87)	37	—	—	47	(7)	68	28 ^(c)
Beneficial interests issued by consolidated VIEs	—	—	—	—	—	—	—	—	—	—
Long-term debt	23,339	40 ^{(c)(e)}	—	—	9,883	(9,833)	1,250	(1,282)	23,397	1,920 ^{(c)(e)}

Year ended December 31, 2019 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2019	
	Fair value at January 1, 2019	Total realized/ unrealized gains/ (losses)	Purchases ^(f)	Sales	Settlements ^(g)	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2019		
Assets:^(a)										
Trading assets:										
Debt instruments:										
Mortgage-backed securities:										
U.S. GSEs and government agencies	\$ 549	\$ (62)	\$ 773	\$ (310)	\$ (134)	\$ 1	\$ (20)	\$ 797	\$ (58)	
Residential - nonagency	64	25	83	(86)	(20)	15	(58)	23	2	
Commercial - nonagency	11	2	20	(26)	(14)	15	(4)	4	1	
Total mortgage-backed securities	624	(35)	876	(422)	(168)	31	(82)	824	(55)	
Obligations of U.S. states and municipalities	689	13	85	(159)	(8)	—	(610)	10	13	
Non-U.S. government debt securities	155	1	290	(287)	—	14	(18)	155	4	
Corporate debt securities	334	47	437	(247)	(52)	112	(73)	558	40	
Loans	738	29	456	(519)	(82)	437	(386)	673	13	
Asset-backed securities	127	—	37	(93)	(40)	28	(22)	37	(3)	
Total debt instruments	2,667	55	2,181	(1,727)	(350)	622	(1,191)	2,257	12	
Equity securities	232	(41)	58	(103)	(22)	181	(109)	196	(18)	
Other	301	(36)	50	(26)	(54)	2	(5)	232	91	
Total trading assets - debt and equity instruments	3,200	(22) ^(c)	2,289	(1,856)	(426)	805	(1,305)	2,685	85 ^(c)	
Net derivative receivables: ^(b)										
Interest rate	(38)	(394)	109	(125)	5	(7)	118	(332)	(599)	
Credit	(107)	(36)	20	(9)	8	29	(44)	(139)	(127)	
Foreign exchange	(297)	(551)	17	(67)	312	(22)	1	(607)	(380)	
Equity	(2,225)	(310)	397	(573)	(503)	(405)	224	(3,395)	(1,608)	
Commodity	(1,129)	497	36	(348)	89	(6)	845	(16)	130	
Total net derivative receivables	(3,796)	(794) ^(c)	579	(1,122)	(89)	(411)	1,144	(4,489)	(2,584) ^(c)	
Available-for-sale securities:										
Mortgage-backed securities	1	—	—	—	—	—	—	1	—	
Corporate debt securities	—	—	—	—	—	—	—	—	—	
Total available-for-sale securities	1	—	—	—	—	—	—	1	—	
Loans	856	59 ^(c)	236	(188)	(482)	188	(153)	516	38 ^(c)	
Mortgage servicing rights	6,130	(1,180) ^(d)	1,489	(789)	(951)	—	—	4,699	(1,180) ^(d)	
Other assets	1,161	(150) ^(c)	229	(166)	(156)	6	(7)	917	(180) ^(c)	

Year ended December 31, 2019 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2019	
	Fair value at January 1, 2019	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements ^(g)	Transfers into level 3	Transfers (out of) level 3		Fair value at Dec. 31, 2019
Liabilities:^(a)										
Deposits	\$ 4,169	\$ 278 ^{(c)(e)}	\$ —	\$ —	\$ 916	\$ (806)	\$ 12	\$ (1,209)	\$ 3,360	\$ 307 ^{(c)(e)}
Short-term borrowings	1,523	229 ^{(c)(e)}	—	—	3,441	(3,356)	85	(248)	1,674	155 ^{(c)(e)}
Trading liabilities - debt and equity instruments	50	2 ^(c)	(22)	41	—	1	16	(47)	41	3 ^(c)
Accounts payable and other liabilities	10	(2) ^(c)	(84)	115	—	—	6	—	45	29 ^(c)
Beneficial interests issued by consolidated VIEs	1	(1) ^(c)	—	—	—	—	—	—	—	—
Long-term debt	19,418	2,815 ^{(c)(e)}	—	—	10,441	(8,538)	651	(1,448)	23,339	2,822 ^{(c)(e)}

(a) Level 3 assets at fair value as a percentage of total Firm assets at fair value (including assets measured at fair value on a nonrecurring basis) were 2%, 1% and 2% at December 31, 2021, 2020 and 2019, respectively. Level 3 liabilities at fair value as a percentage of total Firm liabilities at fair value (including liabilities measured at fair value on a nonrecurring basis) were 10%, 9% and 16% at December 31, 2021, 2020 and 2019, respectively.

Notes to consolidated financial statements

- (b) All level 3 derivatives are presented on a net basis, irrespective of underlying counterparty.
- (c) Predominantly reported in principal transactions revenue, except for changes in fair value for CCB mortgage loans, and lending-related commitments originated with the intent to sell, and mortgage loan purchase commitments, which are reported in mortgage fees and related income.
- (d) Changes in fair value for MSRs are reported in mortgage fees and related income.
- (e) Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue, and were not material for the years ended December 31, 2021, 2020 and 2019. Unrealized (gains)/losses are reported in OCI, and they were \$258 million, \$221 million and \$319 million for the years ended December 31, 2021, 2020 and 2019, respectively.
- (f) Loan originations are included in purchases.
- (g) Includes financial assets and liabilities that have matured, been partially or fully repaid, impacts of modifications, deconsolidations associated with beneficial interests in VIEs and other items.
- (h) Prior-period amounts have been revised to conform with the current presentation.

Level 3 analysis

Consolidated balance sheets changes

The following describes significant changes to level 3 assets since December 31, 2020, for those items measured at fair value on a recurring basis. Refer to Assets and liabilities measured at fair value on a nonrecurring basis on page 187 for further information on changes impacting items measured at fair value on a nonrecurring basis.

For the year ended December 31, 2021

Level 3 assets were \$17.5 billion at December 31, 2021, reflecting an increase of \$1.1 billion from December 31, 2020.

The increase for the year ended December 31, 2021 was predominantly driven by:

- \$2.2 billion increase in MSRs,

partially offset by

- \$287 million decrease in gross interest rate derivative receivables due to settlements net of gains.
- \$372 million decrease in non-trading loans due to settlements net of transfers.

Refer to Note 15 for information on MSRs.

Refer to the sections below for additional information.

Transfers between levels for instruments carried at fair value on a recurring basis

During the year ended December 31, 2021, significant transfers from level 2 into level 3 included the following:

- \$1.0 billion of total debt and equity instruments, largely due to trading loans, driven by a decrease in observability.
- \$1.5 billion of gross equity derivative receivables and \$1.2 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- \$1.3 billion of non-trading loans driven by a decrease in observability.

During the year ended December 31, 2021, significant transfers from level 3 into level 2 included the following:

- \$1.4 billion of total debt and equity instruments, largely due to trading loans, driven by an increase in observability.
- \$1.9 billion of gross equity derivative receivables and \$2.1 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.

- \$794 million of non-trading loans driven by an increase in observability.
- \$809 million of long-term debt driven by an increase in observability and a decrease in the significance of unobservable inputs for structured notes.

During the year ended December 31, 2020, significant transfers from level 2 into level 3 included the following:

- \$1.8 billion of total debt and equity instruments, predominantly equity securities and trading loans, driven by a decrease in observability.
- \$2.6 billion of gross equity derivative receivables and \$3.5 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- \$880 million of gross interest rate derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- \$2.6 billion of non-trading loans driven by a decrease in observability.
- \$1.2 billion of long-term debt driven by a decrease in observability and an increase in the significance of unobservable inputs for structured notes.

During the year ended December 31, 2020, significant transfers from level 3 into level 2 included the following:

- \$2.0 billion of total debt and equity instruments, predominantly due to corporate debt and trading loans, driven by an increase in observability.
- \$2.4 billion of gross equity derivative receivables and \$2.4 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- \$943 million of deposits as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- \$1.3 billion of long-term debt driven by an increase in observability and a decrease in the significance of unobservable inputs for structured notes.

During the year ended December 31, 2019, significant transfers from level 2 into level 3 included the following:

- \$993 million of total debt and equity instruments, the majority of which were trading loans, driven by a decrease in observability.
- \$904 million of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.

During the year ended December 31, 2019, significant transfers from level 3 into level 2 included the following:

- \$1.5 billion of total debt and equity instruments, the majority of which were obligations of U.S. states and municipalities and trading loans, driven by an increase in observability.
- \$1.1 billion of gross equity derivative receivables and \$1.3 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- \$962 million of gross commodities derivative payables as a result of an increase in observability.
- \$1.2 billion of deposits as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- \$1.4 billion of long-term debt as a result of an increase in observability and a decrease in the significance of unobservable inputs.

All transfers are based on changes in the observability and/or significance of the valuation inputs and are assumed to occur at the beginning of the quarterly reporting period in which they occur.

Gains and losses

The following describes significant components of total realized/unrealized gains/(losses) for instruments measured at fair value on a recurring basis for the years ended December 31, 2021, 2020 and 2019. These amounts exclude any effects of the Firm's risk management activities where the financial instruments are classified as level 1 and 2 of the fair value hierarchy. Refer to Changes in level 3 recurring fair value measurements rollforward tables on pages 180-184 for further information on these instruments.

2021

- \$495 million of net gains on assets, driven by gains in net interest rate derivative receivables due to market movements, partially offset by losses in net equity derivative receivables and net commodity derivative receivables due to market movements.
- \$1.1 billion of net gains on liabilities, driven by gains in short-term borrowings due to market movements.

2020

- \$10 million of net gains on assets driven by gains in net interest rate derivative receivables due to market movements largely offset by losses in MSRs reflecting faster prepayment speeds on lower rates.
- \$102 million of net gains on liabilities driven by market movements in short-term borrowings.

2019

- \$2.1 billion of net losses on assets largely due to MSRs reflecting faster prepayment speeds on lower rates.
- \$3.3 billion of net losses on liabilities predominantly driven by market movements in long-term debt.

Refer to Note 15 for additional information on MSRs.

Credit and funding adjustments – derivatives

Derivatives are generally valued using models that use as their basis observable market parameters. These market parameters generally do not consider factors such as counterparty nonperformance risk, the Firm’s own credit quality, and funding costs. Therefore, it is generally necessary to make adjustments to the base estimate of fair value to reflect these factors.

CVA represents the adjustment, relative to the relevant benchmark interest rate, necessary to reflect counterparty nonperformance risk. The Firm estimates CVA using a scenario analysis to estimate the expected positive credit exposure across all of the Firm’s existing positions with each counterparty, and then estimates losses based on the probability of default and estimated recovery rate as a result of a counterparty credit event considering contractual factors designed to mitigate the Firm’s credit exposure, such as collateral and legal rights of offset. The key inputs to this methodology are (i) the probability of a default event occurring for each counterparty, as derived from observed or estimated CDS spreads; and (ii) estimated recovery rates implied by CDS spreads, adjusted to consider the differences in recovery rates as a derivative creditor relative to those reflected in CDS spreads, which generally reflect senior unsecured creditor risk.

FVA represents the adjustment to reflect the impact of funding and is recognized where there is evidence that a market participant in the principal market would incorporate it in a transfer of the instrument. The Firm’s FVA framework, applied to uncollateralized (including partially collateralized) over-the-counter (“OTC”) derivatives incorporates key inputs such as: (i) the expected funding requirements arising from the Firm’s positions with

each counterparty and collateral arrangements; and (ii) the estimated market funding cost in the principal market which, for derivative liabilities, considers the Firm’s credit risk (DVA). For collateralized derivatives, the fair value is estimated by discounting expected future cash flows at the relevant overnight indexed swap rate given the underlying collateral agreement with the counterparty, and therefore a separate FVA is not necessary.

The following table provides the impact of credit and funding adjustments on principal transactions revenue in the respective periods, excluding the effect of any associated hedging activities. The FVA presented below includes the impact of the Firm’s own credit quality on the inception value of liabilities as well as the impact of changes in the Firm’s own credit quality over time.

Year ended December 31, (in millions)	2021	2020	2019
Credit and funding adjustments:			
Derivatives CVA	\$ 362	\$ (337)	\$ 241
Derivatives FVA	47	(64)	199

Valuation adjustments on fair value option elected liabilities

The valuation of the Firm’s liabilities for which the fair value option has been elected requires consideration of the Firm’s own credit risk. DVA on fair value option elected liabilities reflects changes (subsequent to the issuance of the liability) in the Firm’s probability of default and LGD, which are estimated based on changes in the Firm’s credit spread observed in the bond market. Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue. Unrealized (gains)/losses are reported in OCI. Refer to page 184 in this Note and Note 24 for further information.

Assets and liabilities measured at fair value on a nonrecurring basis

The following tables present the assets and liabilities held as of December 31, 2021 and 2020, for which nonrecurring fair value adjustments were recorded during the years ended December 31, 2021 and 2020, by major product category and fair value hierarchy.

December 31, 2021 (in millions)	Fair value hierarchy			Total fair value
	Level 1	Level 2	Level 3	
Loans	\$ –	\$ 1,006	\$ 856 ^(b)	\$ 1,862
Other assets ^(a)	–	4	1,612	1,616
Total assets measured at fair value on a nonrecurring basis	\$ –	\$ 1,010	\$ 2,468	\$ 3,478
Accounts payable and other liabilities	–	–	3	3
Total liabilities measured at fair value on a nonrecurring basis	\$ –	\$ –	\$ 3	\$ 3

December 31, 2020 (in millions)	Fair value hierarchy			Total fair value
	Level 1	Level 2	Level 3	
Loans	\$ –	\$ 1,611	\$ 972	\$ 2,583
Other assets	–	5	979	984
Total assets measured at fair value on a nonrecurring basis	\$ –	\$ 1,616	\$ 1,951	\$ 3,567
Accounts payable and other liabilities	–	–	12	12
Total liabilities measured at fair value on a nonrecurring basis	\$ –	\$ –	\$ 12	\$ 12

- (a) Primarily includes equity securities without readily determinable fair values that were adjusted based on observable price changes in orderly transactions from an identical or similar investment of the same issuer (measurement alternative). Of the \$1.6 billion in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2021, \$1.5 billion related to equity securities adjusted based on the measurement alternative. These equity securities are classified as level 3 due to the infrequency of the observable prices and/or the restrictions on the shares.
- (b) Of the \$856 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2021, \$254 million related to residential real estate loans carried at the net realizable value of the underlying collateral (e.g., collateral-dependent loans). These amounts are classified as level 3 as they are valued using information from broker's price opinions, appraisals and automated valuation models and discounted based upon the Firm's experience with actual liquidation values. These discounts ranged from 12% to 45% with a weighted average of 25%.

Nonrecurring fair value changes

The following table presents the total change in value of assets and liabilities for which fair value adjustments have been recognized for the years ended December 31, 2021, 2020 and 2019, related to assets and liabilities held at those dates.

December 31, (in millions)	2021	2020	2019
Loans	\$ (72)	\$ (393)	\$ (274)
Other assets ^(a)	344	(529)	182
Accounts payable and other liabilities	5	(11)	–
Total nonrecurring fair value gains/(losses)	\$ 277	\$ (933)	\$ (92)

- (a) Included \$379 million, \$(134) million and \$201 million for the years ended December 31, 2021, 2020 and 2019, respectively, of net gains/(losses) as a result of the measurement alternative.

Refer to Note 12 for further information about the measurement of collateral-dependent loans.

Notes to consolidated financial statements

Equity securities without readily determinable fair values

The Firm measures certain equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer (i.e., measurement alternative), with such changes recognized in other income.

In its determination of the new carrying values upon observable price changes, the Firm may adjust the prices if deemed necessary to arrive at the Firm's estimated fair values. Such adjustments may include adjustments to reflect the different rights and obligations of similar securities, and other adjustments that are consistent with the Firm's valuation techniques for private equity direct investments.

The following table presents the carrying value of equity securities without readily determinable fair values held as of December 31, 2021 and 2020, that are measured under the measurement alternative and the related adjustments recorded during the periods presented for those securities with observable price changes. These securities are included in the nonrecurring fair value tables when applicable price changes are observable.

As of or for the year ended December 31, (in millions)	2021	2020
Other assets		
Carrying value ^(a)	\$ 3,642	\$ 2,368
Upward carrying value changes ^(b)	432	167
Downward carrying value changes/impairment ^(c)	(53)	(301)

(a) The period-end carrying values reflect cumulative purchases and sales in addition to upward and downward carrying value changes.

(b) The cumulative upward carrying value changes between January 1, 2018 and December 31, 2021 were \$1.0 billion.

(c) The cumulative downward carrying value changes/impairment between January 1, 2018 and December 31, 2021 were \$(369) million.

Included in other assets above is the Firm's interest in approximately 40 million Visa Class B common shares, recorded at a nominal carrying value. These shares are subject to certain transfer restrictions currently and will be convertible into Visa Class A common shares upon final resolution of certain litigation matters involving Visa. The conversion rate of Visa Class B common shares into Visa Class A common shares is 1.6181 at December 31, 2021, and may be adjusted by Visa depending on developments related to the litigation matters.

Additional disclosures about the fair value of financial instruments that are not carried on the Consolidated balance sheets at fair value

U.S. GAAP requires disclosure of the estimated fair value of certain financial instruments, which are included in the following table. However, this table does not include other items, such as nonfinancial assets, intangible assets, certain financial instruments, and customer relationships. In the opinion of management, these items, in the aggregate, add significant value to JPMorgan Chase, but their fair value is not disclosed in this table.

Financial instruments for which carrying value approximates fair value

Certain financial instruments that are not carried at fair value on the Consolidated balance sheets are carried at amounts that approximate fair value, due to their short-term nature and generally negligible credit risk. These instruments include cash and due from banks, deposits with banks, federal funds sold, securities purchased under resale agreements and securities borrowed, short-term receivables and accrued interest receivable, short-term borrowings, federal funds purchased, securities loaned and sold under repurchase agreements, accounts payable, and accrued liabilities. In addition, U.S. GAAP requires that the fair value of deposit liabilities with no stated maturity (i.e., demand, savings and certain money market deposits) be equal to their carrying value; recognition of the inherent funding value of these instruments is not permitted.

The following table presents by fair value hierarchy classification the carrying values and estimated fair values at December 31, 2021 and 2020, of financial assets and liabilities, excluding financial instruments that are carried at fair value on a recurring basis, and their classification within the fair value hierarchy.

(in billions)	December 31, 2021					December 31, 2020				
	Carrying value	Estimated fair value hierarchy			Total estimated fair value	Carrying value	Estimated fair value hierarchy			Total estimated fair value
		Level 1	Level 2	Level 3			Level 1	Level 2	Level 3	
Financial assets										
Cash and due from banks	\$ 26.4	\$ 26.4	\$ –	\$ –	\$ 26.4	\$ 24.9	\$ 24.9	\$ –	\$ –	\$ 24.9
Deposits with banks	714.4	714.4	–	–	714.4	502.7	502.7	–	–	502.7
Accrued interest and accounts receivable	102.1	–	102.0	0.1	102.1	89.4	–	89.3	0.1	89.4
Federal funds sold and securities purchased under resale agreements	9.0	–	9.0	–	9.0	58.3	–	58.3	–	58.3
Securities borrowed	124.6	–	124.6	–	124.6	107.7	–	107.7	–	107.7
Investment securities, held-to-maturity	363.7	183.3	179.3	–	362.6	201.8	53.2	152.3	–	205.5
Loans, net of allowance for loan losses ^(a)	1,002.5	–	202.1	821.1	1,023.2	940.1	–	210.9	755.6	966.5
Other	98.7	–	97.4	1.4	98.8	81.8	–	80.0	1.9	81.9
Financial liabilities										
Deposits	\$ 2,451.0	\$ –	\$ 2,451.0	\$ –	\$ 2,451.0	\$ 2,129.8	\$ –	\$ 2,128.9	\$ –	\$ 2,128.9
Federal funds purchased and securities loaned or sold under repurchase agreements	67.9	–	67.9	–	67.9	59.5	–	59.5	–	59.5
Short-term borrowings	33.6	–	33.6	–	33.6	28.3	–	28.3	–	28.3
Accounts payable and other liabilities	217.6	–	212.1	4.9	217.0	186.6	–	181.9	4.3	186.2
Beneficial interests issued by consolidated VIEs	10.7	–	10.8	–	10.8	17.5	–	17.6	–	17.6
Long-term debt	226.0	–	229.5	3.1	232.6	204.8	–	209.2	3.2	212.4

(a) Fair value is typically estimated using a discounted cash flow model that incorporates the characteristics of the underlying loans (including principal, contractual interest rate and contractual fees) and other key inputs, including expected lifetime credit losses, interest rates, prepayment rates, and primary origination or secondary market spreads. For certain loans, the fair value is measured based on the value of the underlying collateral. Carrying value of the loan takes into account the loan's allowance for loan losses, which represents the loan's expected credit losses over its remaining expected life. The difference between the estimated fair value and carrying value of a loan is generally attributable to changes in market interest rates, including credit spreads, market liquidity premiums and other factors that affect the fair value of a loan but do not affect its carrying value.

The majority of the Firm's lending-related commitments are not carried at fair value on a recurring basis on the Consolidated balance sheets. The carrying value and the estimated fair value of these wholesale lending-related commitments were as follows for the periods indicated.

(in billions)	December 31, 2021					December 31, 2020				
	Carrying value ^{(a)(b)}	Estimated fair value hierarchy			Total estimated fair value	Carrying value ^{(a)(b)}	Estimated fair value hierarchy			Total estimated fair value
		Level 1	Level 2	Level 3			Level 1	Level 2	Level 3	
Wholesale lending-related commitments	\$ 2.1	\$ –	\$ –	\$ 2.9	\$ 2.9	\$ 2.2	\$ –	\$ –	\$ 2.1	\$ 2.1

(a) Excludes the current carrying values of the guarantee liability and the offsetting asset, each of which is recognized at fair value at the inception of the guarantees.

(b) Includes the wholesale allowance for lending-related commitments.

The Firm does not estimate the fair value of consumer off-balance sheet lending-related commitments. In many cases, the Firm can reduce or cancel these commitments by providing the borrower notice or, in some cases as permitted by law, without notice. Refer to page 171 of this Note for a further discussion of the valuation of lending-related commitments.

Notes to consolidated financial statements

Note 3 – Fair value option

The fair value option provides an option to elect fair value as an alternative measurement for selected financial assets, financial liabilities, unrecognized firm commitments, and written loan commitments.

The Firm has elected to measure certain instruments at fair value for several reasons including to mitigate income statement volatility caused by the differences between the measurement basis of elected instruments (e.g., certain instruments that otherwise would be accounted for on an accrual basis) and the associated risk management arrangements that are accounted for on a fair value basis, as well as to better reflect those instruments that are managed on a fair value basis.

The Firm's election of fair value includes the following instruments:

- Loans purchased or originated as part of securitization warehousing activity, subject to bifurcation accounting, or managed on a fair value basis, including lending-related commitments
- Certain securities financing agreements
- Owned beneficial interests in securitized financial assets that contain embedded credit derivatives, which would otherwise be required to be separately accounted for as a derivative instrument
- Structured notes and other hybrid instruments, which are predominantly financial instruments that contain embedded derivatives, that are issued or transacted as part of client-driven activities
- Certain long-term beneficial interests issued by CIB's consolidated securitization trusts where the underlying assets are carried at fair value

Changes in fair value under the fair value option election

The following table presents the changes in fair value included in the Consolidated statements of income for the years ended December 31, 2021, 2020 and 2019, for items for which the fair value option was elected. The profit and loss information presented below only includes the financial instruments that were elected to be measured at fair value; related risk management instruments, which are required to be measured at fair value, are not included in the table.

December 31, (in millions)	2021			2020			2019		
	Principal transactions	All other income	Total changes in fair value recorded ^(e)	Principal transactions	All other income	Total changes in fair value recorded ^(e)	Principal transactions	All other income	Total changes in fair value recorded ^(e)
Federal funds sold and securities purchased under resale agreements	\$ (112)	\$ —	\$ (112)	\$ 12	\$ —	\$ 12	\$ (36)	\$ —	\$ (36)
Securities borrowed	(200)	—	(200)	143	—	143	133	—	133
Trading assets:									
Debt and equity instruments, excluding loans	(2,171)	(1) ^(c)	(2,172)	2,587 ^(f)	(1) ^(c)	2,586	2,482	(1) ^(c)	2,481
Loans reported as trading assets:									
Changes in instrument-specific credit risk	353	—	353	135	—	135	248	—	248
Other changes in fair value	(8)	—	(8)	(19)	—	(19)	(1)	—	(1)
Loans:									
Changes in instrument-specific credit risk	589	(7) ^(c)	582	190	7 ^(c)	197	475	2 ^(c)	477
Other changes in fair value	(139)	2,056 ^(c)	1,917	470	3,239 ^(c)	3,709	267	1,224 ^(c)	1,491
Other assets	12	(26) ^(d)	(14)	103	(65) ^(d)	38	8	6 ^(d)	14
Deposits ^(a)	(183)	—	(183)	(726)	—	(726)	(1,730)	—	(1,730)
Federal funds purchased and securities loaned or sold under repurchase agreements	69	—	69	(6)	—	(6)	(8)	—	(8)
Short-term borrowings ^(a)	(366)	—	(366)	294	—	294	(693)	—	(693)
Trading liabilities	7	—	7	2	—	2	6	—	6
Other liabilities	(17)	—	(17)	(94)	—	(94)	(16)	—	(16)
Long-term debt ^{(a)(b)}	(980)	4 ^{(c)(d)}	(976)	(2,120)	(1) ^(c)	(2,121)	(6,173)	1 ^(c)	(6,172)

(a) Unrealized gains/(losses) due to instrument-specific credit risk (DVA) for liabilities for which the fair value option has been elected are recorded in OCI while realized gains/(losses) are recorded in principal transactions revenue. Realized gains/(losses) due to instrument-specific credit risk recorded in principal transactions revenue were \$(15) million and \$20 million for the years ended December 31, 2021 and 2020, respectively, and were not material for the year ended December 31, 2019.

(b) Long-term debt measured at fair value predominantly relates to structured notes. Although the risk associated with the structured notes is actively managed, the gains/(losses) reported in this table do not include the income statement impact of the risk management instruments used to manage such risk.

(c) Reported in mortgage fees and related income.

(d) Reported in other income.

(e) Changes in fair value exclude contractual interest, which is included in interest income and interest expense for all instruments other than certain hybrid financial instruments recorded in CIB. Refer to Note 7 for further information regarding interest income and interest expense.

(f) Prior-period amounts have been revised to conform with the current presentation.

Determination of instrument-specific credit risk for items for which the fair value option was elected

The following describes how the gains and losses that are attributable to changes in instrument-specific credit risk, were determined.

- Loans and lending-related commitments: For floating-rate instruments, all changes in value are attributed to instrument-specific credit risk. For fixed-rate instruments, an allocation of the changes in value for the period is made between those changes in value that are interest rate-related and changes in value that are credit-related. Allocations are generally based on an analysis of borrower-specific credit spread and recovery

information, where available, or benchmarking to similar entities or industries.

- Long-term debt: Changes in value attributable to instrument-specific credit risk were derived principally from observable changes in the Firm's credit spread as observed in the bond market.
- Securities financing agreements: Generally, for these types of agreements, there is a requirement that collateral be maintained with a market value equal to or in excess of the principal amount loaned; as a result, there would be no adjustment or an immaterial adjustment for instrument-specific credit risk related to these agreements.

Notes to consolidated financial statements

Difference between aggregate fair value and aggregate remaining contractual principal balance outstanding

The following table reflects the difference between the aggregate fair value and the aggregate remaining contractual principal balance outstanding as of December 31, 2021 and 2020, for loans, long-term debt and long-term beneficial interests for which the fair value option has been elected.

December 31, (in millions)	2021			2020		
	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding
Loans						
Nonaccrual loans						
Loans reported as trading assets	\$ 3,263	\$ 546	\$ (2,717)	\$ 3,386	\$ 555	\$ (2,831)
Loans	918	797	(121)	1,867	1,507	(360)
Subtotal	4,181	1,343	(2,838)	5,253	2,062	(3,191)
90 or more days past due and government guaranteed						
Loans ^(a)	293	281	(12)	328	317	(11)
All other performing loans^(b)						
Loans reported as trading assets	8,594	7,528	(1,066)	7,917	6,439	(1,478)
Loans	57,695	57,742	47	42,022	42,650	628
Subtotal	66,289	65,270	(1,019)	49,939	49,089	(850)
Total loans	\$ 70,763	\$ 66,894	\$ (3,869)	\$ 55,520	\$ 51,468	\$ (4,052)
Long-term debt						
Principal-protected debt	\$ 35,957 ^(d)	\$ 33,799	\$ (2,158)	\$ 40,560 ^(d)	\$ 40,526	\$ (34)
Nonprincipal-protected debt ^(c)	NA	41,135	NA	NA	36,291	NA
Total long-term debt	NA	\$ 74,934	NA	NA	\$ 76,817	NA
Long-term beneficial interests						
Nonprincipal-protected debt ^(c)	NA	\$ 12	NA	NA	\$ 41	NA
Total long-term beneficial interests	NA	\$ 12	NA	NA	\$ 41	NA

(a) These balances are excluded from nonaccrual loans as the loans are insured and/or guaranteed by U.S. government agencies.

(b) There were no performing loans that were ninety days or more past due as of December 31, 2021 and 2020.

(c) Remaining contractual principal is not applicable to nonprincipal-protected structured notes and long-term beneficial interests. Unlike principal-protected structured notes and long-term beneficial interests, for which the Firm is obligated to return a stated amount of principal at maturity, nonprincipal-protected structured notes and long-term beneficial interests do not obligate the Firm to return a stated amount of principal at maturity, but for structured notes to return an amount based on the performance of an underlying variable or derivative feature embedded in the note. However, investors are exposed to the credit risk of the Firm as issuer for both nonprincipal-protected and principal-protected notes.

(d) Where the Firm issues principal-protected zero-coupon or discount notes, the balance reflects the contractual principal payment at maturity or, if applicable, the contractual principal payment at the Firm's next call date.

At December 31, 2021 and 2020, the contractual amount of lending-related commitments for which the fair value option was elected was \$11.9 billion and \$18.1 billion, respectively, with a corresponding fair value of \$10 million and \$(39) million, respectively. Refer to Note 28 for further information regarding off-balance sheet lending-related financial instruments.

Structured note products by balance sheet classification and risk component

The following table presents the fair value of structured notes, by balance sheet classification and the primary risk type.

(in millions)	December 31, 2021				December 31, 2020			
	Long-term debt	Short-term borrowings	Deposits	Total	Long-term debt	Short-term borrowings	Deposits	Total
Risk exposure								
Interest rate	\$ 34,127	\$ 1	\$ 4,860	\$ 38,988	\$ 38,129	\$ 65	\$ 5,057	\$ 43,251
Credit	6,352	858	–	7,210	6,409	1,022	–	7,431
Foreign exchange	3,386	315	1,066	4,767	3,613	92	–	3,705
Equity	29,317	6,827	5,125	41,269	26,943	5,021	6,893	38,857
Commodity	405	–	3 ^(a)	408	250	13	232 ^(a)	495
Total structured notes	\$ 73,587	\$ 8,001	\$ 11,054	\$ 92,642	\$ 75,344	\$ 6,213	\$ 12,182	\$ 93,739

(a) Excludes deposits linked to precious metals for which the fair value option has not been elected of \$692 million and \$739 million for the years ended December 31, 2021 and 2020, respectively.

Note 4 – Credit risk concentrations

Concentrations of credit risk arise when a number of clients, counterparties or customers are engaged in similar business activities or activities in the same geographic region, or when they have similar economic features that would cause their ability to meet contractual obligations to be similarly affected by changes in economic conditions.

JPMorgan Chase regularly monitors various segments of its credit portfolios to assess potential credit risk concentrations and to obtain additional collateral when deemed necessary and permitted under the Firm's agreements. Senior management is significantly involved in the credit approval and review process, and risk levels are adjusted as needed to reflect the Firm's risk appetite.

In the Firm's consumer portfolio, concentrations are managed primarily by product and by U.S. geographic region, with a key focus on trends and concentrations at the portfolio level, where potential credit risk concentrations can be remedied through changes in underwriting policies and portfolio guidelines. Refer to Note 12 for additional information on the geographic composition of the Firm's consumer loan portfolios. In the wholesale portfolio, credit risk concentrations are evaluated primarily by industry and monitored regularly on both an aggregate portfolio level and on an individual client or counterparty basis.

The Firm's wholesale exposure is managed through loan syndications and participations, loan sales, securitizations, credit derivatives, master netting agreements, collateral and other risk-reduction techniques. Refer to Note 12 for additional information on loans.

The Firm does not believe that its exposure to any particular loan product or industry segment results in a significant concentration of credit risk.

Terms of loan products and collateral coverage are included in the Firm's assessment when extending credit and establishing its allowance for loan losses.

The table below presents both on-balance sheet and off-balance sheet consumer and wholesale credit exposure by the Firm's three credit portfolio segments as of December 31, 2021 and 2020. The wholesale industry of risk category is generally based on the client or counterparty's primary business activity.

December 31, (in millions)	2021				2020			
	Credit exposure ^(h)	On-balance sheet		Off-balance sheet ⁽ⁱ⁾	Credit exposure ^(h)	On-balance sheet		Off-balance sheet ⁽ⁱ⁾
		Loans	Derivatives			Loans	Derivatives	
Consumer, excluding credit card	\$ 368,640	\$ 323,306 ^(j)	\$ –	\$ 45,334	\$ 375,898	\$ 318,579 ^(j)	\$ –	\$ 57,319
Credit card^(a)	884,830	154,296	–	730,534	802,722	144,216	–	658,506
Total consumer^(a)	1,253,470	477,602	–	775,868	1,178,620	462,795	–	715,825
Wholesale^(b)								
Real Estate	155,069	119,753	1,113	34,203	148,498	118,299	1,385	28,814
Individuals and Individual Entities ^(c)	141,973	130,576	1,317	10,080	122,870	109,746	1,750	11,374
Consumer & Retail	122,789	39,588	2,669	80,532	108,437	39,013	2,802	66,622
Technology, Media & Telecommunications	84,070	17,815	2,640	63,615	72,150	14,687	4,252	53,211
Asset Managers	81,228	41,031	9,351	30,846	66,573	31,059	9,277	26,237
Industrials	66,974	21,652	1,224	44,098	66,470	21,143	1,851	43,476
Healthcare	59,014	18,587	2,575	37,852	60,118	19,405	3,252	37,461
Banks & Finance Cos	54,684	34,217	4,418	16,049	54,032	31,004	8,044	14,984
Oil & Gas	42,606	11,039	6,034	25,533	39,159	11,267	1,643	26,249
Automotive	34,573	11,759	720	22,094	43,331	17,128	5,995	20,208
State & Municipal Govt ^(d)	33,216	15,322	1,563	16,331	38,286	18,054	2,347	17,885
Utilities	33,203	5,969	3,736	23,498	30,124	4,874	3,340	21,910
Chemicals & Plastics	17,660	5,033	564	12,063	17,176	4,884	856	11,436
Metals & Mining	16,696	5,696	924	10,076	15,542	4,854	882	9,806
Transportation	14,635	5,453	782	8,400	16,232	6,566	1,495	8,171
Insurance	13,926	1,303	2,700	9,923	13,141	1,042	2,527	9,572
Central Govt	11,317	2,889	6,837	1,591	17,025	3,396	12,313	1,316
Financial Markets Infrastructure	4,377	5	2,487	1,885	6,515	19	3,757	2,739
Securities Firms	4,180	469	1,260	2,451	8,048	469	4,838	2,741
All other ^(e)	111,690	72,198	4,167	35,325	96,527	58,038	2,838 ^(k)	35,651
Subtotal	1,103,880	560,354	57,081	486,445	1,040,254	514,947	75,444	449,863
Loans held-for-sale and loans at fair value	39,758	39,758	–	–	35,111	35,111	–	–
Receivables from customers ^(f)	59,645	–	–	–	47,710	–	–	–
Total wholesale	1,203,283	600,112	57,081	486,445	1,123,075	550,058	75,444	449,863
Total exposure^{(g)(h)}	\$ 2,456,753	\$ 1,077,714	\$ 57,081	\$ 1,262,313	\$ 2,301,695	\$ 1,012,853	\$ 75,444	\$ 1,165,688

(a) Also includes commercial card lending-related commitments primarily in CB and CIB.

(b) The industry rankings presented in the table as of December 31, 2020, are based on the industry rankings of the corresponding exposures at December 31, 2021, not actual rankings of such exposures at December 31, 2020.

(c) Individuals and Individual Entities predominantly consists of Global Private Bank clients within AWM and includes exposure to personal investment companies and personal and testamentary trusts.

(d) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2021 and 2020, noted above, the Firm held: \$7.1 billion and \$7.2 billion, respectively, of trading assets; \$15.9 billion and \$20.4 billion, respectively, of AFS securities; and \$14.0 billion and \$12.8 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. Refer to Note 2 and Note 10 for further information.

(e) All other includes: SPEs and Private education and civic organizations, representing approximately 94% and 6%, respectively, at December 31, 2021 and 92% and 8%, respectively, at December 31, 2020. Refer to Note 14 for more information on exposures to SPEs.

(f) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM that are collateralized by assets maintained in the clients' brokerage accounts (e.g., cash on deposit, liquid and readily marketable debt or equity securities). Because of this collateralization, no allowance for credit losses is generally held against these receivables. To manage its credit risk the Firm establishes margin requirements and monitors the required margin levels on an ongoing basis, and requires clients to deposit additional cash or other collateral, or to reduce positions, when appropriate. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.

(g) Excludes cash placed with banks of \$729.6 billion and \$516.9 billion, at December 31, 2021 and 2020, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.

(h) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.

(i) At December 31, 2021 and 2020, included \$5.4 billion and \$19.2 billion of loans in Business Banking under the PPP, respectively. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

(j) Represents lending-related financial instruments.

(k) Prior-period amounts have been revised to conform with the current presentation.

Note 5 – Derivative instruments

Derivative contracts derive their value from underlying asset prices, indices, reference rates, other inputs or a combination of these factors and may expose counterparties to risks and rewards of an underlying asset or liability without having to initially invest in, own or exchange the asset or liability. JPMorgan Chase makes markets in derivatives for clients and also uses derivatives to hedge or manage its own risk exposures. Predominantly all of the Firm's derivatives are entered into for market-making or risk management purposes.

Market-making derivatives

The majority of the Firm's derivatives are entered into for market-making purposes. Clients use derivatives to mitigate or modify interest rate, credit, foreign exchange, equity and commodity risks. The Firm actively manages the risks from its exposure to these derivatives by entering into other derivative contracts or by purchasing or selling other financial instruments that partially or fully offset the exposure from client derivatives.

Risk management derivatives

The Firm manages certain market and credit risk exposures using derivative instruments, including derivatives in hedge accounting relationships and other derivatives that are used to manage risks associated with specified assets and liabilities.

The Firm generally uses interest rate derivatives to manage the risk associated with changes in interest rates. Fixed-rate assets and liabilities appreciate or depreciate in market value as interest rates change. Similarly, interest income and expense increase or decrease as a result of variable-rate assets and liabilities resetting to current market rates, and as a result of the repayment and subsequent origination or issuance of fixed-rate assets and liabilities at current market rates. Gains and losses on the derivative instruments related to these assets and liabilities are expected to substantially offset this variability.

Foreign currency derivatives are used to manage the foreign exchange risk associated with certain foreign currency-denominated (i.e., non-U.S. dollar) assets and liabilities and forecasted transactions, as well as the Firm's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. As a result of fluctuations in foreign currencies, the U.S. dollar-equivalent values of the foreign currency-denominated assets and liabilities or the forecasted revenues or expenses increase or decrease. Gains or losses on the derivative instruments related to these foreign currency-denominated assets or liabilities, or forecasted transactions, are expected to substantially offset this variability.

Commodities derivatives are used to manage the price risk of certain commodities inventories. Gains or losses on these derivative instruments are expected to substantially offset the depreciation or appreciation of the related inventory.

Credit derivatives are used to manage the counterparty credit risk associated with loans and lending-related commitments. Credit derivatives compensate the purchaser when the entity referenced in the contract experiences a credit event, such as bankruptcy or a failure to pay an obligation when due. Credit derivatives primarily consist of CDS. Refer to the Credit derivatives section on pages 207-210 of this Note for a further discussion of credit derivatives.

Refer to the risk management derivatives gains and losses table on page 207 of this Note, and the hedge accounting gains and losses tables on pages 204-206 of this Note for more information about risk management derivatives.

Derivative counterparties and settlement types

The Firm enters into OTC derivatives, which are negotiated and settled bilaterally with the derivative counterparty. The Firm also enters into, as principal, certain ETD such as futures and options, and OTC-cleared derivative contracts with CCPs. ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is the Firm's counterparty from the inception of the transactions. OTC-cleared derivatives are traded on a bilateral basis and then novated to the CCP for clearing.

Derivative clearing services

The Firm provides clearing services for clients in which the Firm acts as a clearing member at certain exchanges and clearing houses. The Firm does not reflect the clients' derivative contracts in its Consolidated Financial Statements. Refer to Note 28 for further information on the Firm's clearing services.

Accounting for derivatives

All free-standing derivatives that the Firm executes for its own account are required to be recorded on the Consolidated balance sheets at fair value.

As permitted under U.S. GAAP, the Firm nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between the Firm and the derivative counterparty. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. The accounting for changes in value of a derivative depends on whether or not the transaction has been designated and qualifies for hedge accounting. Derivatives that are not designated as hedges are reported and measured at fair value through earnings. The tabular disclosures on pages 200-207 of this Note provide additional information on the amount of, and reporting for, derivative assets, liabilities, gains and losses. Refer to Notes 2 and 3 for a further discussion of derivatives embedded in structured notes.

Derivatives designated as hedges

The Firm applies hedge accounting to certain derivatives executed for risk management purposes – generally interest rate, foreign exchange and commodity derivatives.

However, JPMorgan Chase does not seek to apply hedge accounting to all of the derivatives involved in the Firm's risk management activities. For example, the Firm does not apply hedge accounting to purchased CDS used to manage the credit risk of loans and lending-related commitments, because of the difficulties in qualifying such contracts as hedges. For the same reason, the Firm does not apply hedge accounting to certain interest rate, foreign exchange, and commodity derivatives used for risk management purposes.

To qualify for hedge accounting, a derivative must be highly effective at reducing the risk associated with the exposure being hedged. In addition, for a derivative to be designated as a hedge, the risk management objective and strategy must be documented. Hedge documentation must identify the derivative hedging instrument, the asset or liability or forecasted transaction and type of risk to be hedged, and how the effectiveness of the derivative is assessed prospectively and retrospectively. To assess effectiveness, the Firm uses statistical methods such as regression analysis, nonstatistical methods such as dollar-value comparisons of the change in the fair value of the derivative to the change in the fair value or cash flows of the hedged item, and qualitative comparisons of critical terms and the evaluation of any changes in those terms. The extent to which a derivative has been, and is expected to continue to be, highly effective at offsetting changes in the fair value or cash flows of the hedged item must be assessed and documented at least quarterly. If it is determined that a derivative is not highly effective at hedging the designated exposure, hedge accounting is discontinued.

There are three types of hedge accounting designations: fair value hedges, cash flow hedges and net investment hedges. JPMorgan Chase uses fair value hedges primarily to hedge fixed-rate long-term debt, AFS securities and certain commodities inventories. For qualifying fair value hedges, the changes in the fair value of the derivative, and in the value of the hedged item for the risk being hedged, are recognized in earnings. Certain amounts excluded from the assessment of effectiveness are recorded in OCI and recognized in earnings over the life of the derivative. If the hedge relationship is terminated, then the adjustment to the hedged item continues to be reported as part of the basis of the hedged item, and for benchmark interest rate hedges, is amortized to earnings as a yield adjustment. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily net interest income and principal transactions revenue.

JPMorgan Chase uses cash flow hedges primarily to hedge the exposure to variability in forecasted cash flows from floating-rate assets and liabilities and foreign currency-denominated revenue and expense. For qualifying cash flow

hedges, changes in the fair value of the derivative are recorded in OCI and recognized in earnings as the hedged item affects earnings. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily noninterest revenue, net interest income and compensation expense. If the hedge relationship is terminated, then the change in value of the derivative recorded in AOCI is recognized in earnings when the cash flows that were hedged affect earnings. For hedge relationships that are discontinued because a forecasted transaction is expected to not occur according to the original hedge forecast, any related derivative values recorded in AOCI are immediately recognized in earnings.

JPMorgan Chase uses net investment hedges to protect the value of the Firm's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. For qualifying net investment hedges, changes in the fair value of the derivatives due to changes in spot foreign exchange rates are recorded in OCI as translation adjustments. Amounts excluded from the assessment of effectiveness are recorded directly in earnings.

Notes to consolidated financial statements

The following table outlines the Firm's primary uses of derivatives and the related hedge accounting designation or disclosure category.

Type of Derivative	Use of Derivative	Designation and disclosure	Affected segment or unit	Page reference
Manage specifically identified risk exposures in qualifying hedge accounting relationships:				
• Interest rate	Hedge fixed rate assets and liabilities	Fair value hedge	Corporate	204-205
• Interest rate	Hedge floating-rate assets and liabilities	Cash flow hedge	Corporate	206
• Foreign exchange	Hedge foreign currency-denominated assets and liabilities	Fair value hedge	Corporate	204-205
• Foreign exchange	Hedge foreign currency-denominated forecasted revenue and expense	Cash flow hedge	Corporate	206
• Foreign exchange	Hedge the value of the Firm's investments in non-U.S. dollar functional currency entities	Net investment hedge	Corporate	206
• Commodity	Hedge commodity inventory	Fair value hedge	CIB, AWM	204-205
Manage specifically identified risk exposures not designated in qualifying hedge accounting relationships:				
• Interest rate	Manage the risk associated with mortgage commitments, warehouse loans and MSRs	Specified risk management	CCB	207
• Credit	Manage the credit risk associated with wholesale lending exposures	Specified risk management	CIB	207
• Interest rate and foreign exchange	Manage the risk associated with certain other specified assets and liabilities	Specified risk management	Corporate	207
Market-making derivatives and other activities:				
• Various	Market-making and related risk management	Market-making and other	CIB	207
• Various	Other derivatives	Market-making and other	CIB, AWM, Corporate	207

Notional amount of derivative contracts

The following table summarizes the notional amount of free-standing derivative contracts outstanding as of December 31, 2021 and 2020.

December 31, (in billions)	Notional amounts ^(b)	
	2021	2020
Interest rate contracts		
Swaps	\$ 24,075	\$ 20,990 ^(c)
Futures and forwards	2,520	3,057
Written options	3,018	3,375
Purchased options	3,188	3,675
Total interest rate contracts	32,801	31,097
Credit derivatives^(a)	1,053	1,197 ^(c)
Foreign exchange contracts		
Cross-currency swaps	4,112	3,924
Spot, futures and forwards	7,679	6,871
Written options	741	830
Purchased options	727	825
Total foreign exchange contracts	13,259	12,450
Equity contracts		
Swaps	612	448
Futures and forwards	139	140
Written options	654	668 ^(c)
Purchased options	598	610 ^(c)
Total equity contracts	2,003	1,866
Commodity contracts		
Swaps	185	138
Spot, futures and forwards	188	198
Written options	135	124
Purchased options	111	105
Total commodity contracts	619	565
Total derivative notional amounts	\$ 49,735	\$ 47,175

(a) Refer to the Credit derivatives discussion on pages 207-210 for more information on volumes and types of credit derivative contracts.

(b) Represents the sum of gross long and gross short third-party notional derivative contracts.

(c) Prior-period amounts have been revised to conform with the current presentation.

While the notional amounts disclosed above give an indication of the volume of the Firm's derivatives activity, the notional amounts significantly exceed, in the Firm's view, the possible losses that could arise from such transactions. For most derivative contracts, the notional amount is not exchanged; it is simply a reference amount used to calculate payments.

Notes to consolidated financial statements

Impact of derivatives on the Consolidated balance sheets

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on the Firm's Consolidated balance sheets as of December 31, 2021 and 2020, by accounting designation (e.g., whether the derivatives were designated in qualifying hedge accounting relationships or not) and contract type.

Free-standing derivative receivables and payables^(a)

December 31, 2021 (in millions)	Gross derivative receivables				Gross derivative payables			
	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables ^(b)	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables ^(b)
Trading assets and liabilities								
Interest rate	\$ 270,562	\$ 23	\$ 270,585	\$ 21,974	\$ 240,731	\$ –	\$ 240,731	\$ 8,194
Credit	9,839	–	9,839	1,031	10,912	–	10,912	880
Foreign exchange	169,186	393	169,579	12,625	174,622	1,124	175,746	14,097
Equity	68,631	–	68,631	9,981	79,727	–	79,727	17,233
Commodity	21,233	5,420	26,653	11,470	20,837	7,091	27,928	9,712
Total fair value of trading assets and liabilities	\$ 539,451	\$ 5,836	\$ 545,287	\$ 57,081	\$ 526,829	\$ 8,215	\$ 535,044	\$ 50,116

December 31, 2020 (in millions)	Gross derivative receivables				Gross derivative payables			
	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables ^(b)	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables ^(b)
Trading assets and liabilities								
Interest rate	\$ 390,817 ^(c)	\$ 831	\$ 391,648	\$ 35,725	\$ 353,987 ^(c)	\$ –	\$ 353,987	\$ 13,012
Credit	13,345 ^(c)	–	13,345	680	14,832 ^(c)	–	14,832	1,995
Foreign exchange	205,359	901	206,260	15,781	214,229	1,697	215,926	21,433
Equity	70,612 ^(c)	–	70,612	16,487 ^(c)	81,413	–	81,413	25,898
Commodity	20,579	924	21,503	6,771	20,834	1,895	22,729	8,285
Total fair value of trading assets and liabilities	\$ 700,712	\$ 2,656	\$ 703,368	\$ 75,444	\$ 685,295	\$ 3,592	\$ 688,887	\$ 70,623

(a) Balances exclude structured notes for which the fair value option has been elected. Refer to Note 3 for further information.

(b) As permitted under U.S. GAAP, the Firm has elected to net derivative receivables and derivative payables and the related cash collateral receivables and payables when a legally enforceable master netting agreement exists.

(c) Prior-period amounts have been revised to conform with the current presentation.

Derivatives netting

The following tables present, as of December 31, 2021 and 2020, gross and net derivative receivables and payables by contract and settlement type. Derivative receivables and payables, as well as the related cash collateral from the same counterparty, have been netted on the Consolidated balance sheets where the Firm has obtained an appropriate legal opinion with respect to the master netting agreement. Where such a legal opinion has not been either sought or obtained, amounts are not eligible for netting on the Consolidated balance sheets, and those derivative receivables and payables are shown separately in the tables below.

In addition to the cash collateral received and transferred that is presented on a net basis with derivative receivables and payables, the Firm receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with the Firm's derivative instruments, but are not eligible for net presentation:

- collateral that consists of liquid securities and other cash collateral held at third-party custodians, which are shown separately as "Collateral not nettable on the Consolidated balance sheets" in the tables below, up to the fair value exposure amount. For the purpose of this disclosure, the definition of liquid securities is consistent with the definition of high quality liquid assets as defined in the LCR rule;
- the amount of collateral held or transferred that exceeds the fair value exposure at the individual counterparty level, as of the date presented, which is excluded from the tables below; and
- collateral held or transferred that relates to derivative receivables or payables where an appropriate legal opinion has not been either sought or obtained with respect to the master netting agreement, which is excluded from the tables below.

December 31, (in millions)	2021			2020		
	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables
U.S. GAAP nettable derivative receivables						
Interest rate contracts:						
OTC	\$ 251,953	\$ (234,283)	\$ 17,670	\$ 367,214 ^(e)	\$ (337,609) ^(e)	\$ 29,605
OTC-cleared	14,144	(13,839)	305	18,340	(17,919)	421
Exchange-traded ^(a)	498	(489)	9	554	(395)	159
Total interest rate contracts	266,595	(248,611)	17,984	386,108	(355,923)	30,185
Credit contracts:						
OTC	8,035	(7,177)	858	8,894 ^(e)	(8,356) ^(e)	538
OTC-cleared	1,671	(1,631)	40	4,326	(4,309)	17
Total credit contracts	9,706	(8,808)	898	13,220	(12,665)	555
Foreign exchange contracts:						
OTC	166,185	(156,251)	9,934	201,349	(189,655)	11,694
OTC-cleared	789	(703)	86	834	(819)	15
Exchange-traded ^(a)	6	–	6	35	(5)	30
Total foreign exchange contracts	166,980	(156,954)	10,026	202,218	(190,479)	11,739
Equity contracts:						
OTC	25,704	(23,977)	1,727	29,844 ^(e)	(27,374)	2,470
Exchange-traded ^(a)	36,095	(34,673)	1,422	28,294	(26,751)	1,543
Total equity contracts	61,799	(58,650)	3,149	58,138	(54,125)	4,013
Commodity contracts:						
OTC	15,063	(6,868)	8,195	10,924	(7,901)	3,023
OTC-cleared	49	(49)	–	20	(20)	–
Exchange-traded ^(a)	8,279	(8,266)	13	6,833	(6,811)	22
Total commodity contracts	23,391	(15,183)	8,208	17,777	(14,732)	3,045
Derivative receivables with appropriate legal opinion	528,471	(488,206)	40,265 ^(d)	677,461	(627,924)	49,537 ^(d)
Derivative receivables where an appropriate legal opinion has not been either sought or obtained	16,816		16,816	25,907		25,907
Total derivative receivables recognized on the Consolidated balance sheets	\$ 545,287		\$ 57,081	\$ 703,368		\$ 75,444
Collateral not nettable on the Consolidated balance sheets ^{(b)(c)}			(10,102)			(14,806)
Net amounts			\$ 46,979			\$ 60,638

Notes to consolidated financial statements

December 31, (in millions)	2021			2020		
	Gross derivative payables	Amounts netted on the Consolidated balance sheets	Net derivative payables	Gross derivative payables	Amounts netted on the Consolidated balance sheets	Net derivative payables
U.S. GAAP nettable derivative payables						
Interest rate contracts:						
OTC	\$ 223,576	\$ (216,757)	\$ 6,819	\$ 332,214 ^(e)	\$ (321,140) ^(e)	\$ 11,074
OTC-cleared	15,695	(15,492)	203	19,710	(19,494)	216
Exchange-traded ^(a)	292	(288)	4	358	(341)	17
Total interest rate contracts	239,563	(232,537)	7,026	352,282	(340,975)	11,307
Credit contracts:						
OTC	9,021	(8,421)	600	10,311 ^(e)	(8,781) ^(e)	1,530
OTC-cleared	1,679	(1,611)	68	4,075	(4,056)	19
Total credit contracts	10,700	(10,032)	668	14,386	(12,837)	1,549
Foreign exchange contracts:						
OTC	171,610	(160,946)	10,664	210,803	(193,672)	17,131
OTC-cleared	706	(703)	3	836	(819)	17
Exchange-traded ^(a)	7	–	7	34	(2)	32
Total foreign exchange contracts	172,323	(161,649)	10,674	211,673	(194,493)	17,180
Equity contracts:						
OTC	31,379	(27,830)	3,549	35,330	(28,763)	6,567
Exchange-traded ^(a)	40,621	(34,664)	5,957	34,491	(26,752)	7,739
Total equity contracts	72,000	(62,494)	9,506	69,821	(55,515)	14,306
Commodity contracts:						
OTC	14,874	(9,667)	5,207	10,365	(7,544)	2,821
OTC-cleared	73	(73)	–	32	(32)	–
Exchange-traded ^(a)	8,954	(8,476)	478	7,391	(6,868)	523
Total commodity contracts	23,901	(18,216)	5,685	17,788	(14,444)	3,344
Derivative payables with appropriate legal opinion	518,487	(484,928)	33,559 ^(d)	665,950	(618,264)	47,686 ^(d)
Derivative payables where an appropriate legal opinion has not been either sought or obtained	16,557		16,557	22,937		22,937
Total derivative payables recognized on the Consolidated balance sheets	\$ 535,044		\$ 50,116	\$ 688,887		\$ 70,623
Collateral not nettable on the Consolidated balance sheets ^{(b)(c)}			(5,872)			(11,964)
Net amounts			\$ 44,244			\$ 58,659

(a) Exchange-traded derivative balances that relate to futures contracts are settled daily.

(b) Includes liquid securities and other cash collateral held at third-party custodians related to derivative instruments where an appropriate legal opinion has been obtained. For some counterparties, the collateral amounts of financial instruments may exceed the derivative receivables and derivative payables balances. Where this is the case, the total amount reported is limited to the net derivative receivables and net derivative payables balances with that counterparty.

(c) Derivative collateral relates only to OTC and OTC-cleared derivative instruments.

(d) Net derivatives receivable included cash collateral netted of \$67.6 billion and \$88.0 billion at December 31, 2021 and 2020, respectively. Net derivatives payable included cash collateral netted of \$64.3 billion and \$78.4 billion at December 31, 2021 and 2020, respectively. Derivative cash collateral relates to OTC and OTC-cleared derivative instruments.

(e) Prior-period amounts have been revised to conform with the current presentation.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose JPMorgan Chase to credit risk – the risk that derivative counterparties may fail to meet their payment obligations under the derivative contracts and the collateral, if any, held by the Firm proves to be of insufficient value to cover the payment obligation. It is the policy of JPMorgan Chase to actively pursue, where possible, the use of legally enforceable master netting arrangements and collateral agreements to mitigate derivative counterparty credit risk inherent in derivative receivables.

While derivative receivables expose the Firm to credit risk, derivative payables expose the Firm to liquidity risk, as the derivative contracts typically require the Firm to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor or upon specified downgrades in the Firm's and its subsidiaries' respective credit ratings. Certain derivative contracts also provide for termination of the contract, generally upon a downgrade of either the Firm or the counterparty, at the fair value of the derivative contracts. The following table shows the aggregate fair value of net derivative payables related to OTC and OTC-cleared derivatives that contain contingent collateral or termination features that may be triggered upon a ratings downgrade, and the associated collateral the Firm has posted in the normal course of business, at December 31, 2021 and 2020.

OTC and OTC-cleared derivative payables containing downgrade triggers

December 31, (in millions)	2021	2020
Aggregate fair value of net derivative payables	\$ 20,114	\$ 26,945 ^(a)
Collateral posted	19,402	26,289

(a) Prior-period amount has been revised to conform with the current presentation.

The following table shows the impact of a single-notch and two-notch downgrade of the long-term issuer ratings of JPMorgan Chase & Co. and its subsidiaries, predominantly JPMorgan Chase Bank, N.A., at December 31, 2021 and 2020, related to OTC and OTC-cleared derivative contracts with contingent collateral or termination features that may be triggered upon a ratings downgrade. Derivatives contracts generally require additional collateral to be posted or terminations to be triggered when the predefined rating threshold is breached. A downgrade by a single rating agency that does not result in a rating lower than a preexisting corresponding rating provided by another major rating agency will generally not result in additional collateral (except in certain instances in which additional initial margin may be required upon a ratings downgrade), nor in termination payment requirements. The liquidity impact in the table is calculated based upon a downgrade below the lowest current rating of the rating agencies referred to in the derivative contract.

Liquidity impact of downgrade triggers on OTC and OTC-cleared derivatives

December 31, (in millions)	2021		2020	
	Single-notch downgrade	Two-notch downgrade	Single-notch downgrade	Two-notch downgrade
Amount of additional collateral to be posted upon downgrade ^(a)	\$ 219	\$ 1,577	\$ 119	\$ 1,243
Amount required to settle contracts with termination triggers upon downgrade ^(b)	98	787	153	1,682 ^(c)

(a) Includes the additional collateral to be posted for initial margin.

(b) Amounts represent fair values of derivative payables, and do not reflect collateral posted.

(c) Prior-period amount has been revised to conform with the current presentation.

Derivatives executed in contemplation of a sale of the underlying financial asset

In certain instances the Firm enters into transactions in which it transfers financial assets but maintains the economic exposure to the transferred assets by entering into a derivative with the same counterparty in contemplation of the initial transfer. The Firm generally accounts for such transfers as collateralized financing transactions as described in Note 11, but in limited circumstances they may qualify to be accounted for as a sale and a derivative under U.S. GAAP. The amount of such transfers accounted for as a sale where the associated derivative was outstanding was not material at both December 31, 2021 and 2020.

Notes to consolidated financial statements

Impact of derivatives on the Consolidated statements of income

The following tables provide information related to gains and losses recorded on derivatives based on their hedge accounting designation or purpose.

Fair value hedge gains and losses

The following tables present derivative instruments, by contract type, used in fair value hedge accounting relationships, as well as pre-tax gains/(losses) recorded on such derivatives and the related hedged items for the years ended December 31, 2021, 2020 and 2019, respectively. The Firm includes gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the related hedged item.

Year ended December 31, 2021 (in millions)	Gains/(losses) recorded in income			Income statement impact of excluded components ^(e)		OCI impact
	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI ^(f)
Contract type						
Interest rate ^{(a)(b)}	\$ (4,323)	\$ 6,363	\$ 2,040	\$ –	\$ 2,159	\$ –
Foreign exchange ^(c)	(1,317)	1,349	32	(286)	32	(26)
Commodity ^(d)	(9,609)	9,710	101	–	72	–
Total	\$ (15,249)	\$ 17,422	\$ 2,173	\$ (286)	\$ 2,263	\$ (26)

Year ended December 31, 2020 (in millions)	Gains/(losses) recorded in income			Income statement impact of excluded components ^(e)		OCI impact
	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI ^(f)
Contract type						
Interest rate ^{(a)(b)}	\$ 2,962	\$ (1,889)	\$ 1,073	\$ –	\$ 1,093	\$ –
Foreign exchange ^(c)	793	(619)	174	(457)	174	25
Commodity ^(d)	(2,507)	2,650	143	–	137	–
Total	\$ 1,248	\$ 142	\$ 1,390	\$ (457)	\$ 1,404	\$ 25

Year ended December 31, 2019 (in millions)	Gains/(losses) recorded in income			Income statement impact of excluded components ^(e)		OCI impact
	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI ^(f)
Contract type						
Interest rate ^{(a)(b)}	\$ 3,204	\$ (2,373)	\$ 831	\$ –	\$ 828	\$ –
Foreign exchange ^(c)	154	328	482	(866)	482	39
Commodity ^(d)	(77)	148	71	–	63	–
Total	\$ 3,281	\$ (1,897)	\$ 1,384	\$ (866)	\$ 1,373	\$ 39

- (a) Primarily consists of hedges of the benchmark (e.g., London Interbank Offered Rate (“LIBOR”), Secured Overnight Financing Rate (“SOFR”)) interest rate risk of fixed-rate long-term debt and AFS securities. Gains and losses were recorded in net interest income.
- (b) Excludes the amortization expense associated with the inception hedge accounting adjustment applied to the hedged item. This expense is recorded in net interest income and substantially offsets the income statement impact of the excluded components. Also excludes the accrual of interest on interest rate swaps and the related hedged items.
- (c) Primarily consists of hedges of the foreign currency risk of long-term debt and AFS securities for changes in spot foreign currency rates. Gains and losses related to the derivatives and the hedged items due to changes in foreign currency rates and the income statement impact of excluded components were recorded primarily in principal transactions revenue and net interest income.
- (d) Consists of overall fair value hedges of physical commodities inventories that are generally carried at the lower of cost or net realizable value (net realizable value approximates fair value). Gains and losses were recorded in principal transactions revenue.
- (e) The assessment of hedge effectiveness excludes certain components of the changes in fair values of the derivatives and hedged items such as forward points on foreign exchange forward contracts, time values and cross-currency basis spreads. Excluded components may impact earnings either through amortization of the initial amount over the life of the derivative or through fair value changes recognized in the current period.
- (f) Represents the change in value of amounts excluded from the assessment of effectiveness under the amortization approach, predominantly cross-currency basis spreads. The amount excluded at inception of the hedge is recognized in earnings over the life of the derivative.

As of December 31, 2021 and 2020, the following amounts were recorded on the Consolidated balance sheets related to certain cumulative fair value hedge basis adjustments that are expected to reverse through the income statement in future periods as an adjustment to yield.

December 31, 2021 (in millions)	Carrying amount of the hedged items ^{(a),(b)}	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items:		
		Active hedging relationships ^(d)	Discontinued hedging relationships ^{(d),(e)}	Total
Assets				
Investment securities - AFS	\$ 65,746 ^(c)	\$ 417	\$ 661	\$ 1,078
Liabilities				
Long-term debt	\$ 195,642	\$ (1,999)	\$ 8,834	\$ 6,835
Beneficial interests issued by consolidated VIEs	749	—	(1)	(1)

December 31, 2020 (in millions)	Carrying amount of the hedged items ^{(a),(b)}	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items:		
		Active hedging relationships ^(d)	Discontinued hedging relationships ^{(d),(e)}	Total
Assets				
Investment securities - AFS	\$ 139,684 ^(c)	\$ 3,572	\$ 847	\$ 4,419
Liabilities				
Long-term debt	\$ 177,611	\$ 3,194	\$ 11,473	\$ 14,667
Beneficial interests issued by consolidated VIEs	746	—	(3)	(3)

- (a) Excludes physical commodities with a carrying value of \$25.7 billion and \$11.5 billion at December 31, 2021 and 2020, respectively, to which the Firm applies fair value hedge accounting. As a result of the application of hedge accounting, these inventories are carried at fair value, thus recognizing unrealized gains and losses in current periods. Since the Firm exits these positions at fair value, there is no incremental impact to net income in future periods.
- (b) Excludes hedged items where only foreign currency risk is the designated hedged risk, as basis adjustments related to foreign currency hedges will not reverse through the income statement in future periods. At December 31, 2021 and 2020, the carrying amount excluded for AFS securities is \$14.0 billion and \$14.5 billion, respectively, and for long-term debt is \$10.8 billion and \$6.6 billion, respectively.
- (c) Carrying amount represents the amortized cost, net of allowance if applicable. Refer to Note 10 for additional information.
- (d) Positive amounts related to assets represent cumulative fair value hedge basis adjustments that will reduce net interest income in future periods. Positive (negative) amounts related to liabilities represent cumulative fair value hedge basis adjustments that will increase (reduce) net interest income in future periods.
- (e) Represents basis adjustments existing on the balance sheet date associated with hedged items that have been de-designated from qualifying fair value hedging relationships.

Notes to consolidated financial statements

Cash flow hedge gains and losses

The following tables present derivative instruments, by contract type, used in cash flow hedge accounting relationships, and the pre-tax gains/(losses) recorded on such derivatives, for the years ended December 31, 2021, 2020 and 2019, respectively. The Firm includes the gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the change in cash flows on the related hedged item.

Year ended December 31, 2021 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate ^(a)	\$ 1,032	\$ (2,370)	\$ (3,402)
Foreign exchange ^(b)	190	67	(123)
Total	\$ 1,222	\$ (2,303)	\$ (3,525)

Year ended December 31, 2020 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate ^(a)	\$ 570	\$ 3,582	\$ 3,012
Foreign exchange ^(b)	–	41	41
Total	\$ 570	\$ 3,623	\$ 3,053

Year ended December 31, 2019 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate ^(a)	\$ (28)	\$ (3)	\$ 25
Foreign exchange ^(b)	(75)	125	200
Total	\$ (103)	\$ 122	\$ 225

(a) Primarily consists of hedges of contractually specified floating-rate (e.g., LIBOR and SOFR-indexed) assets and liabilities. Gains and losses were recorded in net interest income.

(b) Primarily consists of hedges of the foreign currency risk of non-U.S. dollar-denominated revenue and expense. The income statement classification of gains and losses follows the hedged item – primarily noninterest revenue and compensation expense.

The Firm did not experience any forecasted transactions that failed to occur for the years ended 2021, 2020 and 2019.

Over the next 12 months, the Firm expects that approximately \$671 million (after-tax) of net gains recorded in AOCI at December 31, 2021, related to cash flow hedges will be recognized in income. For cash flow hedges that have been terminated, the maximum length of time over which the derivative results recorded in AOCI will be recognized in earnings is approximately eight years, corresponding to the timing of the originally hedged forecasted cash flows. For open cash flow hedges, the maximum length of time over which forecasted transactions are hedged is approximately six years. The Firm's longer-dated forecasted transactions relate to core lending and borrowing activities.

Net investment hedge gains and losses

The following table presents hedging instruments, by contract type, that were used in net investment hedge accounting relationships, and the pre-tax gains/(losses) recorded on such instruments for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions)	2021		2020		2019	
	Amounts recorded in income ^{(a)(b)}	Amounts recorded in OCI	Amounts recorded in income ^{(a)(b)}	Amounts recorded in OCI	Amounts recorded in income ^{(a)(b)}	Amounts recorded in OCI
Foreign exchange derivatives	\$(228)	\$2,452	\$(122)	\$(1,408)	\$72	\$64

(a) Certain components of hedging derivatives are permitted to be excluded from the assessment of hedge effectiveness, such as forward points on foreign exchange forward contracts. The Firm elects to record changes in fair value of these amounts directly in other income.

(b) Excludes amounts reclassified from AOCI to income on the sale or liquidation of hedged entities. The amount reclassified for the year ended December 31, 2021 was not material. The Firm reclassified net pre-tax gains of \$3 million and \$18 million to other income related to the liquidation of certain legal entities during the years ended December 31, 2020 and 2019, respectively. Refer to Note 24 for further information.

Gains and losses on derivatives used for specified risk management purposes

The following table presents pre-tax gains/(losses) recorded on a limited number of derivatives, not designated in hedge accounting relationships, that are used to manage risks associated with certain specified assets and liabilities, including certain risks arising from mortgage commitments, warehouse loans, MSRs, wholesale lending exposures, and foreign currency denominated assets and liabilities.

Year ended December 31, (in millions)	Derivatives gains/(losses) recorded in income		
	2021	2020	2019
Contract type			
Interest rate ^(a)	\$ 1,078	\$ 2,994	\$ 1,491
Credit ^(b)	(94)	(176)	(30)
Foreign exchange ^(c)	94	43	(5)
Total	\$ 1,078	\$ 2,861	\$ 1,456

- (a) Primarily represents interest rate derivatives used to hedge the interest rate risk inherent in mortgage commitments, warehouse loans and MSRs, as well as written commitments to originate warehouse loans. Gains and losses were recorded predominantly in mortgage fees and related income.
- (b) Relates to credit derivatives used to mitigate credit risk associated with lending exposures in the Firm's wholesale businesses. These derivatives do not include credit derivatives used to mitigate counterparty credit risk arising from derivative receivables, which is included in gains and losses on derivatives related to market-making activities and other derivatives. Gains and losses were recorded in principal transactions revenue.
- (c) Primarily relates to derivatives used to mitigate foreign exchange risk of specified foreign currency-denominated assets and liabilities. Gains and losses were recorded in principal transactions revenue.

Gains and losses on derivatives related to market-making activities and other derivatives

The Firm makes markets in derivatives in order to meet the needs of customers and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. All derivatives not included in the hedge accounting or specified risk management categories above are included in this category. Gains and losses on these derivatives are primarily recorded in principal transactions revenue. Refer to Note 6 for information on principal transactions revenue.

Credit derivatives

Credit derivatives are financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) and which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Credit derivatives expose the protection purchaser to the creditworthiness of the protection seller, as the protection seller is required to make payments under the contract when the reference entity experiences a credit event, such as a bankruptcy, a failure to pay its obligation or a restructuring. The seller of credit protection receives a premium for providing protection but has the risk that the underlying instrument referenced in the contract will be subject to a credit event.

The Firm is both a purchaser and seller of protection in the credit derivatives market and uses these derivatives for two primary purposes. First, in its capacity as a market-maker, the Firm actively manages a portfolio of credit derivatives by purchasing and selling credit protection, predominantly on corporate debt obligations, to meet the needs of customers. Second, as an end-user, the Firm uses credit derivatives to manage credit risk associated with lending exposures (loans and unfunded commitments) in its wholesale and consumer businesses and derivatives counterparty exposures in its wholesale businesses, and to manage the credit risk arising from certain financial instruments in the Firm's market-making businesses. Following is a summary of various types of credit derivatives.

Notes to consolidated financial statements

Credit default swaps

Credit derivatives may reference the credit of either a single reference entity (“single-name”), broad-based index or portfolio. The Firm purchases and sells protection on both single- name and index-reference obligations. Single-name CDS and index CDS contracts are either OTC or OTC-cleared derivative contracts. Single-name CDS are used to manage the default risk of a single reference entity, while index CDS contracts are used to manage the credit risk associated with the broader credit markets or credit market segments. Like the S&P 500 and other market indices, a CDS index consists of a portfolio of CDS across many reference entities. New series of CDS indices are periodically established with a new underlying portfolio of reference entities to reflect changes in the credit markets. If one of the reference entities in the index experiences a credit event, then the reference entity that defaulted is removed from the index. CDS can also be referenced against specific portfolios of reference names or against customized exposure levels based on specific client demands: for example, to provide protection against the first \$1 million of realized credit losses in a \$10 million portfolio of exposure. Such structures are commonly known as tranche CDS.

For both single-name CDS contracts and index CDS contracts, upon the occurrence of a credit event, under the terms of a CDS contract neither party to the CDS contract has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value of the reference obligation at settlement of the credit derivative contract, also known as the recovery value. The protection purchaser does not need to hold the debt instrument of the underlying reference entity in order to receive amounts due under the CDS contract when a credit event occurs.

Credit-related notes

A credit-related note is a funded credit derivative where the issuer of the credit-related note purchases from the note investor credit protection on a reference entity or an index. Under the contract, the investor pays the issuer the par value of the note at the inception of the transaction, and in return, the issuer pays periodic payments to the investor, based on the credit risk of the referenced entity. The issuer also repays the investor the par value of the note at maturity unless the reference entity (or one of the entities that makes up a reference index) experiences a specified credit event. If a credit event occurs, the issuer is not obligated to repay the par value of the note, but rather, the issuer pays the investor the difference between the par value of the note and the fair value of the defaulted reference obligation at the time of settlement. Neither party to the credit-related note has recourse to the defaulting reference entity.

The following tables present a summary of the notional amounts of credit derivatives and credit-related notes the Firm sold and purchased as of December 31, 2021 and 2020. Upon a credit event, the Firm as a seller of protection would typically pay out only a percentage of the full notional amount of net protection sold, as the amount actually required to be paid on the contracts takes into account the recovery value of the reference obligation at the time of settlement. The Firm manages the credit risk on contracts to sell protection by purchasing protection with identical or similar underlying reference entities. Other purchased protection referenced in the following tables includes credit derivatives bought on related, but not identical, reference positions (including indices, portfolio coverage and other reference points) as well as protection purchased by CIB through credit-related notes primarily in its market-making businesses. In addition, the Firm obtains credit protection against certain loans in the retained consumer portfolio through the issuance of credit-related notes. Since these credit-related notes are not part of the market-making businesses they are not included in the table below.

The Firm does not use notional amounts of credit derivatives as the primary measure of risk management for such derivatives, because the notional amount does not take into account the probability of the occurrence of a credit event, the recovery value of the reference obligation, or related cash instruments and economic hedges, each of which reduces, in the Firm's view, the risks associated with such derivatives.

Total credit derivatives and credit-related notes

December 31, 2021 (in millions)	Maximum payout/Notional amount			
	Protection sold	Protection purchased with identical underlyings ^(c)	Net protection (sold)/purchased ^(d)	Other protection purchased ^(e)
Credit derivatives				
Credit default swaps	\$ (443,481)	\$ 458,180	\$ 14,699	\$ 2,269
Other credit derivatives ^(a)	(56,130)	79,586	23,456	13,435
Total credit derivatives	(499,611)	537,766	38,155	15,704
Credit-related notes ^(b)	–	–	–	9,437
Total	\$ (499,611)	\$ 537,766	\$ 38,155	\$ 25,141

December 31, 2020 (in millions)	Maximum payout/Notional amount			
	Protection sold	Protection purchased with identical underlyings ^(c)	Net protection (sold)/purchased ^(d)	Other protection purchased ^(e)
Credit derivatives				
Credit default swaps	\$ (533,900) ^(f)	\$ 552,021 ^(f)	\$ 18,121	\$ 2,786 ^(f)
Other credit derivatives ^(a)	(40,084)	57,344	17,260	10,630 ^(f)
Total credit derivatives	(573,984)	609,365	35,381	13,416
Credit-related notes ^(b)	–	–	–	10,248
Total	\$ (573,984)	\$ 609,365	\$ 35,381	\$ 23,664

(a) Other credit derivatives predominantly consist of credit swap options and total return swaps.

(b) Represents Other protection purchased by CIB, primarily in its market-making businesses.

(c) Represents the total notional amount of protection purchased where the underlying reference instrument is identical to the reference instrument on protection sold; the notional amount of protection purchased for each individual identical underlying reference instrument may be greater or lower than the notional amount of protection sold.

(d) Does not take into account the fair value of the reference obligation at the time of settlement, which would generally reduce the amount the seller of protection pays to the buyer of protection in determining settlement value.

(e) Represents protection purchased by the Firm on referenced instruments (single-name, portfolio or index) where the Firm has not sold any protection on the identical reference instrument.

(f) Prior-period amounts have been revised to conform with the current presentation.

Notes to consolidated financial statements

The following tables summarize the notional amounts by the ratings, maturity profile, and total fair value, of credit derivatives as of December 31, 2021 and 2020, where JPMorgan Chase is the seller of protection. The maturity profile is based on the remaining contractual maturity of the credit derivative contracts. The ratings profile is based on the rating of the reference entity on which the credit derivative contract is based. The ratings and maturity profile of credit derivatives where JPMorgan Chase is the purchaser of protection are comparable to the profile reflected below.

Protection sold – credit derivatives ratings^(a)/maturity profile

December 31, 2021 (in millions)	<1 year	1-5 years	>5 years	Total notional amount	Fair value of receivables ^(b)	Fair value of payables ^(b)	Net fair value
Risk rating of reference entity							
Investment-grade	\$ (91,155)	\$ (255,106)	\$ (29,035)	\$ (375,296)	\$ 3,645	\$ (623)	\$ 3,022
Noninvestment-grade	(32,175)	(84,851)	(7,289)	(124,315)	2,630	(2,003)	627
Total	\$ (123,330)	\$ (339,957)	\$ (36,324)	\$ (499,611)	\$ 6,275	\$ (2,626)	\$ 3,649
December 31, 2020 (in millions)	<1 year	1-5 years	>5 years	Total notional amount	Fair value of receivables ^(b)	Fair value of payables ^(b)	Net fair value
Risk rating of reference entity							
Investment-grade	\$ (93,529) ^(c)	\$ (306,830) ^(c)	\$ (35,326)	\$ (435,685)	\$ 5,372 ^(c)	\$ (834) ^(c)	\$ 4,538
Noninvestment-grade	(31,809)	(97,337)	(9,153)	(138,299)	3,953	(2,542)	1,411
Total	\$ (125,338)	\$ (404,167)	\$ (44,479)	\$ (573,984)	\$ 9,325	\$ (3,376)	\$ 5,949

(a) The ratings scale is primarily based on external credit ratings defined by S&P and Moody's.

(b) Amounts are shown on a gross basis, before the benefit of legally enforceable master netting agreements including cash collateral netting.

(c) Prior-period amounts have been revised to conform with the current presentation.

Note 6 – Noninterest revenue and noninterest expense

Noninterest revenue

The Firm records noninterest revenue from certain contracts with customers in investment banking fees, deposit-related fees, asset management, administration, and commissions, and components of card income. The related contracts are often terminable on demand and the Firm has no remaining obligation to deliver future services. For arrangements with a fixed term, the Firm may commit to deliver services in the future. Revenue associated with these remaining performance obligations typically depends on the occurrence of future events or underlying asset values, and is not recognized until the outcome of those events or values are known.

Investment banking fees

This revenue category includes debt and equity underwriting and advisory fees. As an underwriter, the Firm helps clients raise capital via public offering and private placement of various types of debt and equity instruments. Underwriting fees are primarily based on the issuance price and quantity of the underlying instruments, and are recognized as revenue typically upon execution of the client's transaction. The Firm also manages and syndicates loan arrangements. Credit arrangement and syndication fees, included within debt underwriting fees, are recorded as revenue after satisfying certain retention, timing and yield criteria.

The Firm also provides advisory services, by assisting its clients with mergers and acquisitions, divestitures, restructuring and other complex transactions. Advisory fees are recognized as revenue typically upon execution of the client's transaction.

The following table presents the components of investment banking fees.

Year ended December 31, (in millions)	2021	2020	2019
Underwriting			
Equity	\$ 3,969	\$ 2,759	\$ 1,648
Debt	4,853	4,362	3,513
Total underwriting	8,822	7,121	5,161
Advisory	4,394	2,365	2,340
Total investment banking fees	\$ 13,216	\$ 9,486	\$ 7,501

Investment banking fees are earned primarily by CIB. Refer to Note 32 for segment results.

Principal transactions

Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities, and on private equity investments.
 - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
 - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Firm transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk.

Refer to Note 5 for further information on the income statement classification of gains and losses from derivatives activities.

In the financial commodity markets, the Firm transacts in OTC derivatives (e.g., swaps, forwards, options) and ETD that reference a wide range of underlying commodities. In the physical commodity markets, the Firm primarily purchases and sells precious and base metals and may hold other commodities inventories under financing and other arrangements with clients.

The following table presents all realized and unrealized gains and losses recorded in principal transactions revenue. This table excludes interest income and interest expense on trading assets and liabilities, which are an integral part of the overall performance of the Firm's client-driven market-making activities in CIB and fund deployment activities in Treasury and CIO. Refer to Note 7 for further information on interest income and interest expense.

Trading revenue is presented primarily by instrument type. The Firm's client-driven market-making businesses generally utilize a variety of instrument types in connection with their market-making and related risk-management activities; accordingly, the trading revenue presented in the table below is not representative of the total revenue of any individual LOB.

Notes to consolidated financial statements

Year ended December 31, (in millions)	2021	2020	2019
Trading revenue by instrument type			
Interest rate ^(a)	\$ 1,646	\$ 2,575	\$ 2,739
Credit ^(b)	2,691	2,753	1,628
Foreign exchange	2,787	4,253	3,179
Equity	7,773	6,171	5,589
Commodity	1,428	2,088	1,133
Total trading revenue	16,325	17,840	14,268
Private equity gains/(losses)	(21)	181	(250)
Principal transactions	\$ 16,304	\$ 18,021	\$ 14,018

(a) Includes the impact of changes in funding valuation adjustments on derivatives.

(b) Includes the impact of changes in credit valuation adjustments on derivatives, net of the associated hedging activities.

Principal transactions revenue is earned primarily by CIB. Refer to Note 32 for segment results.

Lending- and deposit-related fees

Lending-related fees include fees earned from loan commitments, standby letters of credit, financial guarantees, and other loan-servicing activities. Deposit-related fees include fees earned from providing overdraft and other deposit account services, and from performing cash management activities. Lending- and deposit-related fees in this revenue category are recognized over the period in which the related service is provided.

The following table presents the components of lending- and deposit-related fees.

Year ended December 31, (in millions)	2021	2020	2019
Lending-related fees	\$ 1,472	\$ 1,271	\$ 1,184
Deposit-related fees	5,560	5,240	5,442
Total lending- and deposit-related fees	\$ 7,032	\$ 6,511	\$ 6,626

Lending- and deposit-related fees are earned by CCB, CIB, CB, and AWM. Refer to Note 32 for segment results.

Asset management, administration and commissions

This revenue category includes fees from investment management and related services, custody, brokerage services and other products. The Firm manages assets on behalf of its clients, including investors in Firm-sponsored funds and owners of separately managed investment accounts. Management fees are typically based on the value of assets under management and are collected and recognized at the end of each period over which the management services are provided and the value of the managed assets is known. The Firm also receives performance-based management fees, which are earned based on exceeding certain benchmarks or other performance targets and are accrued and recognized when the probability of reversal is remote, typically at the end of the related billing period. The Firm has contractual arrangements with third parties to provide distribution and other services in connection with its asset management activities. Amounts paid to these third-party service providers are generally recorded in professional and

outside services expense.

The following table presents the components of Firmwide asset management, administration and commissions.

Year ended December 31, (in millions)	2021	2020	2019
Asset management fees			
Investment management fees ^(a)	\$ 14,027	\$ 11,694	\$ 10,865
All other asset management fees ^(b)	378	338	315
Total asset management fees	14,405	12,032	11,180
Total administration fees ^(c)	2,554	2,249	2,197
Commissions and other fees			
Brokerage commissions ^(d)	3,046	2,959	2,439
All other commissions and fees	1,024	937	1,092
Total commissions and fees	4,070	3,896	3,531
Total asset management, administration and commissions	\$ 21,029	\$ 18,177	\$ 16,908

(a) Represents fees earned from managing assets on behalf of the Firm's clients, including investors in Firm-sponsored funds and owners of separately managed investment accounts.

(b) Represents fees for services that are ancillary to investment management services, such as commissions earned on the sales or distribution of mutual funds to clients. These fees are recorded as revenue at the time the service is rendered or, in the case of certain distribution fees based on the underlying fund's asset value and/or investor redemption, recorded over time as the investor remains in the fund or upon investor redemption.

(c) Predominantly includes fees for custody, securities lending, funds services and securities clearance. These fees are recorded as revenue over the period in which the related service is provided.

(d) Represents commissions earned when the Firm acts as a broker, by facilitating its clients' purchases and sales of securities and other financial instruments. Brokerage commissions are collected and recognized as revenue upon occurrence of the client transaction. The Firm reports certain costs paid to third-party clearing houses and exchanges net against commission revenue.

Asset management, administration and commissions are earned primarily by AWM, CIB and CCB. Refer to Note 32 for segment results.

Mortgage fees and related income

This revenue category reflects CCB's Home Lending production and net mortgage servicing revenue.

Production revenue includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans.

Production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option. Net mortgage servicing revenue includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair

value adjustments of certain repurchased loans insured by U.S. government agencies.

Refer to Note 15 for further information on risk management activities and MSRs.

Net interest income from mortgage loans is recorded in interest income.

Card income

This revenue category includes interchange and other income from credit and debit card transactions; and fees earned from processing card transactions for merchants, both of which are recognized when purchases are made by a cardholder and presented net of certain transaction-related costs. Card income also includes account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

Certain credit card products offer the cardholder the ability to earn points based on account activity, which the cardholder can choose to redeem for cash and non-cash rewards. The cost to the Firm related to these proprietary rewards programs varies based on multiple factors including the terms and conditions of the rewards programs, cardholder activity, cardholder reward redemption rates and cardholder reward selections. The Firm maintains a liability for its obligations under its rewards programs and reports the current-period cost as a reduction of card income.

Credit card revenue sharing agreements

The Firm has contractual agreements with numerous co-brand partners that grant the Firm exclusive rights to issue co-branded credit card products and market them to the customers of such partners. These partners endorse the co-brand credit card programs and provide their customer or member lists to the Firm. The partners may also conduct marketing activities and provide rewards redeemable under their own loyalty programs that the Firm will grant to co-brand credit cardholders based on account activity. The terms of these agreements generally range from five to ten years.

The Firm typically makes payments to the co-brand credit card partners based on the cost of partners' marketing activities and loyalty program rewards provided to credit cardholders, new account originations and sales volumes. Payments to partners based on marketing efforts undertaken by the partners are expensed by the Firm as incurred and reported as marketing expense. Payments for partner loyalty program rewards are reported as a reduction of card income when incurred. Payments to partners based on new credit card account originations are accounted for as direct loan origination costs and are deferred and recognized as a reduction of card income on a straight-line basis over a 12-month period. Payments to partners based on sales volumes are reported as a reduction of card income when the related interchange income is earned.

The following table presents the components of card income:

Year ended December 31, (in millions)	2021	2020	2019
Interchange and merchant processing income	\$ 23,592	\$ 18,563	\$ 20,370
Reward costs and partner payments	(17,868)	(13,637)	(14,540)
Other card income ^(a)	(622)	(491)	(754)
Total card income	\$ 5,102	\$ 4,435	\$ 5,076

(a) Predominantly represents the amortization of account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

Card income is earned primarily by CCB, CIB and CB. Refer to Note 32 for segment results.

Refer to Note 18 for information on operating lease income included within **other income**.

Noninterest expense

Other expense

Other expense on the Firm's Consolidated statements of income included the following:

Year ended December 31, (in millions)	2021	2020	2019
Legal expense	\$ 426	\$ 1,115	\$ 239

Notes to consolidated financial statements

Note 7 – Interest income and Interest expense

Interest income and interest expense are recorded in the Consolidated statements of income and classified based on the nature of the underlying asset or liability.

The following table presents the components of interest income and interest expense:

Year ended December 31, (in millions)	2021	2020	2019
Interest income			
Loans ^(a)	\$ 41,537	\$ 43,758	\$ 51,855
Taxable securities	6,460	7,843	7,962
Non-taxable securities ^(b)	1,063	1,184	1,329
Total investment securities ^(a)	7,523	9,027	9,291
Trading assets - debt instruments	6,825	7,832	9,141
Federal funds sold and securities purchased under resale agreements	958	2,436	6,146
Securities borrowed ^(c)	(385)	(302)	1,574
Deposits with banks	512	749	3,887
All other interest-earning assets ^(d)	894	1,023	2,146
Total interest income	\$ 57,864	\$ 64,523	\$ 84,040
Interest expense			
Interest bearing deposits	\$ 531	\$ 2,357	\$ 8,957
Federal funds purchased and securities loaned or sold under repurchase agreements	274	1,058	4,630
Short-term borrowings ^(e)	126	372	1,248
Trading liabilities - debt and all other interest-bearing liabilities ^{(c)(f)}	257	195	2,585
Long-term debt	4,282	5,764	8,807
Beneficial interest issued by consolidated VIEs	83	214	568
Total interest expense	\$ 5,553	\$ 9,960	\$ 26,795
Net interest income	\$ 52,311	\$ 54,563	\$ 57,245
Provision for credit losses	(9,256)	17,480	5,585
Net interest income after provision for credit losses	\$ 61,567	\$ 37,083	\$ 51,660

- (a) Includes the amortization/accretion of unearned income (e.g., purchase premiums/discounts and net deferred fees/costs).
- (b) Represents securities that are tax-exempt for U.S. federal income tax purposes.
- (c) Negative interest income is related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.
- (d) Includes interest earned on brokerage-related held-for-investment customer receivables, which are classified in accrued interest and accounts receivable, and all other interest-earning assets, which are classified in other assets on the Consolidated balance sheets.
- (e) Includes commercial paper.
- (f) All other interest-bearing liabilities includes interest expense on brokerage-related customer payables.

Interest income and interest expense includes the current-period interest accruals for financial instruments measured at fair value, except for derivatives and financial instruments containing embedded derivatives that would be separately accounted for in accordance with U.S. GAAP, absent the fair value option election; for those instruments, all changes in fair value including any interest elements, are primarily reported in principal transactions revenue. For financial instruments that are not measured at fair value, the related interest is included within interest income or interest expense, as applicable. Refer to Notes 12, 10, 11 and 20 for further information on accounting for interest income and interest expense related to loans, investment securities, securities financing activities (i.e., securities purchased or sold under resale or repurchase agreements; securities borrowed; and securities loaned) and long-term debt, respectively.

Note 8 – Pension and other postretirement employee benefit plans

The Firm has various defined benefit pension plans and OPEB plans that provide benefits to its employees in the U.S. and certain non-U.S. locations. Substantially all the defined benefit pension plans are closed to new participants. The principal defined benefit pension plan in the U.S., which covered substantially all U.S. employees, was closed to new participants and frozen for existing participants on January 1, 2020, (and January 1, 2019 for new hires on or after December 2, 2017). Interest credits continue to accrue to participants' accounts based on their accumulated balances.

The Firm maintains funded and unfunded postretirement benefit plans that provide medical and life insurance for certain eligible employees and retirees as well as their

dependents covered under these programs. None of these plans have a material impact on the Firm's Consolidated Financial Statements.

The Firm also provides a qualified defined contribution plan in the U.S. and maintains other similar arrangements in certain non-U.S. locations. The most significant of these plans is the JPMorgan Chase 401(k) Savings Plan ("the 401(k) Savings Plan"), which covers substantially all U.S. employees. Employees can contribute to the 401(k) Savings Plan on a pretax and/or Roth 401(k) after-tax basis. The Firm makes an annual matching contribution as well as an annual profit-sharing contribution to the 401(k) Savings Plan on behalf of eligible participants.

The following table presents the pretax benefit obligations, plan assets, the net funded status, and the amounts recorded in AOCI on the Consolidated balance sheets for the Firm's defined benefit pension and OPEB plans.

As of or for the year ended December 31, (in millions)	Defined benefit pension and OPEB plans	
	2021	2020
Projected benefit obligations	\$ (18,046)	\$ (19,137)
Fair value of plan assets	25,692	25,417
Net funded status	7,646	6,280
Accumulated other comprehensive income/(loss)	(453)	(1,586)

The weighted-average discount rate used to value the benefit obligations as of December 31, 2021 and 2020, was 2.54% and 2.17%, respectively.

Gains and losses

Gains or losses resulting from changes in the benefit obligation and the fair value of plan assets are recorded in OCI. Amortization of net gains or losses are recognized as part of the net periodic benefit cost over subsequent periods, if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the projected benefit obligation or the fair value of the plan assets. Amortization is generally over the average expected remaining lifetime of plan participants, given the frozen status of most plans. For the years ended December 31, 2021 and 2020, the net gain was predominantly attributable to a market-driven increase in the fair value of plan assets and changes in the discount rate.

The following table presents the components of net periodic benefit costs reported in the Consolidated statements of income for the Firm's defined benefit pension, defined contribution and OPEB plans, and in other comprehensive income for the defined benefit pension and OPEB plans.

Year ended December 31, (in millions)	Pension and OPEB plans		
	2021	2020	2019
Total net periodic defined benefit plan cost/(credit)	\$ (201)	\$ (285)	\$ 144
Total defined contribution plans	1,333	1,332	952
Total pension and OPEB cost included in noninterest expense	\$ 1,132	\$ 1,047	\$ 1,096
Total recognized in other comprehensive income	\$ (1,129)	\$ (214)	\$ (1,157)

The following table presents the weighted-average actuarial assumptions used to determine the net periodic benefit costs for the defined benefit pension and OPEB plans.

Year ended December 31,	Defined benefit pension and OPEB plans		
	2021	2020	2019
Discount rate	2.17 %	2.93 %	3.89 %
Expected long-term rate of return on plan assets	2.97 %	3.91 %	5.08 %

Notes to consolidated financial statements

Plan assumptions

The Firm's expected long-term rate of return is a blended weighted average, by asset allocation of the projected long-term returns for the various asset classes, taking into consideration local market conditions and the specific allocation of plan assets. Returns on asset classes are developed using a forward-looking approach and are not strictly based on historical returns, with consideration given to current market conditions and the portfolio mix of each plan.

The discount rates used in determining the benefit obligations are generally provided by the Firm's actuaries, with the Firm's principal defined benefit pension plan using a rate that was selected by reference to the yields on portfolios of bonds with maturity dates and coupons that closely match each of the plan's projected cash flows.

Investment strategy and asset allocation

The assets of the Firm's defined benefit pension plans are held in various trusts and are invested in well-diversified portfolios of equity and fixed income securities, cash and cash equivalents, and alternative investments. The Firm regularly reviews the asset allocations and asset managers, as well as other factors that could impact the portfolios, which are rebalanced when deemed necessary. The approved asset allocation ranges by asset class for the Firm's principal defined benefit plan are 42-100% debt securities, 0-40% equity securities, 0-3% real estate, and 0-12% alternatives as of December 31, 2021.

As of December 31, 2021, assets held by the Firm's defined benefit pension and OPEB plans do not include securities issued by JPMorgan Chase or its affiliates, except through indirect exposures through investments in exchange traded funds, mutual funds and collective investment funds managed by third-parties. The defined benefit pension and OPEB plans hold investments that are sponsored or managed by affiliates of JPMorgan Chase in the amount of \$2.5 billion and \$2.7 billion, as of December 31, 2021 and 2020, respectively.

Fair value measurement of the plans' assets and liabilities

Refer to Note 2 for information on fair value measurements, including descriptions of level 1, 2, and 3 of the fair value hierarchy and the valuation methods employed by the Firm.

Pension plan assets and liabilities measured at fair value

December 31, (in millions)	Defined benefit pension and OPEB plans							
	2021				2020			
	Level 1 ^(a)	Level 2 ^(b)	Level 3 ^(c)	Total fair value	Level 1 ^(a)	Level 2 ^(b)	Level 3 ^(c)	Total fair value
Assets measured at fair value classified in fair value hierarchy	\$ 6,541	\$ 12,315	\$ 3,172	\$ 22,028	\$ 7,031	\$ 12,384	\$ 2,952	\$ 22,367
Assets measured at fair value using NAV as practical expedient not classified in fair value hierarchy				3,960				3,651
Net defined benefit pension plan payables not classified in fair value hierarchy				(296)				(601)
Total fair value of plan assets				\$ 25,692				\$ 25,417

(a) Consists largely of equity securities.

(b) Consists largely of corporate debt securities.

(c) Consists of corporate-owned life insurance policies and participating annuity contracts.

Changes in level 3 fair value measurements using significant unobservable inputs

Investments classified in level 3 of the fair value hierarchy increased \$220 million in 2021 from \$3.0 billion to \$3.2 billion, predominantly due to \$332 million in unrealized gains, partially offset by \$94 million in settlements. In 2020, there was an increase of \$263 million, from \$2.7 billion to \$3.0 billion consisting of \$343 million in unrealized gains and \$33 million of transfers into level 3, partially offset by \$118 million in settlements.

Estimated future benefit payments

The following table presents benefit payments expected to be paid for the defined benefit pension and OPEB plans for the years indicated.

Year ended December 31, (in millions)	Defined benefit pension and OPEB plans
2022	\$ 1,124
2023	1,106
2024	1,082
2025	1,036
2026	1,016
Years 2027-2031	4,740

Note 9 – Employee share-based incentives

Employee share-based awards

In 2021, 2020 and 2019, JPMorgan Chase granted long-term share-based awards to certain employees under its LTIP, as amended and restated effective May 15, 2018, and subsequently amended effective May 18, 2021. Under the terms of the LTIP, as of December 31, 2021, 83 million shares of common stock were available for issuance through May 2025. The LTIP is the only active plan under which the Firm is currently granting share-based incentive awards. In the following discussion, the LTIP, plus prior Firm plans and plans assumed as the result of acquisitions, are referred to collectively as the “LTI Plans,” and such plans constitute the Firm’s share-based incentive plans.

RSUs are awarded at no cost to the recipient upon their grant. Generally, RSUs are granted annually and vest at a rate of 50% after two years and 50% after three years and are converted into shares of common stock as of the vesting date. In addition, RSUs typically include full-career eligibility provisions, which allow employees to continue to vest upon voluntary termination based on age or service-related requirements, subject to post-employment and other restrictions. All RSU awards are subject to forfeiture until vested and contain clawback provisions that may result in cancellation under certain specified circumstances. Predominantly all RSUs entitle the recipient to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSUs are outstanding.

Performance share units (“PSUs”) are granted annually, and approved by the Firm’s Board of Directors, to members of the Firm’s Operating Committee under the variable compensation program. PSUs are subject to the Firm’s achievement of specified performance criteria over a three-year period. The number of awards that vest can range from zero to 150% of the grant amount. In addition, dividends that accrue during the vesting period are reinvested in dividend equivalent share units. PSUs and the related dividend equivalent share units are converted into shares of common stock after vesting.

Once the PSUs and dividend equivalent share units have vested, the shares of common stock that are delivered, after applicable tax withholding, must be held for an additional two-year period, for a total combined vesting and holding period of approximately five to eight years from the grant date depending on regulations in certain countries.

Under the LTI Plans, stock appreciation rights (“SARs”) and stock options have generally been granted with an exercise price equal to the fair value of JPMorgan Chase’s common stock on the grant date. SARs and stock options generally expire ten years after the grant date. In 2021, the Firm awarded its Chairman and CEO and its President and Chief Operating Officer 1.5 million and 750,000 SARs, respectively. There were no material grants of SARs or stock options in 2020 and 2019.

The Firm separately recognizes compensation expense for each tranche of each award, net of estimated forfeitures, as if it were a separate award with its own vesting date. Generally, for each tranche granted, compensation expense is recognized on a straight-line basis from the grant date until the vesting date of the respective tranche, provided that the employees will not become full-career eligible during the vesting period. For awards with full-career eligibility provisions and awards granted with no future substantive service requirement, the Firm accrues the estimated value of awards expected to be awarded to employees as of the grant date without giving consideration to the impact of post-employment restrictions. For each tranche granted to employees who will become full-career eligible during the vesting period, compensation expense is recognized on a straight-line basis from the grant date until the earlier of the employee’s full-career eligibility date or the vesting date of the respective tranche.

The Firm’s policy for issuing shares upon settlement of employee share-based incentive awards is to issue either new shares of common stock or treasury shares. During 2021, 2020 and 2019, the Firm settled all of its employee share-based awards by issuing treasury shares.

Refer to Note 23 for further information on the classification of share-based awards for purposes of calculating earnings per share.

RSUs, PSUs, SARs and stock options activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for SARs and stock options, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes JPMorgan Chase's RSUs, PSUs, SARs and stock options activity for 2021.

Year ended December 31, 2021 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs		SARs/Options			
	Number of units	Weighted-average grant date fair value	Number of awards	Weighted-average exercise price	Weighted-average remaining contractual life (in years)	Aggregate intrinsic value
Outstanding, January 1	47,510	\$ 112.85	3,124	\$ 41.25		
Granted	20,347	138.98	2,250	152.19		
Exercised or vested	(20,235)	107.26	(2,005)	39.08		
Forfeited	(2,217)	126.77	–	–		
Canceled	NA	NA	–	–		
Outstanding, December 31	45,405	\$ 126.32	3,369	\$ 116.62	6.8	\$ 141,872
Exercisable, December 31	NA	NA	1,119	45.14	0.9	127,030

The total fair value of RSUs that vested during the years ended December 31, 2021, 2020 and 2019, was \$2.9 billion, \$2.8 billion and \$2.9 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2021, 2020 and 2019, was \$232 million, \$182 million and \$503 million, respectively.

Compensation expense

The Firm recognized the following noncash compensation expense related to its various employee share-based incentive plans in its Consolidated statements of income.

Year ended December 31, (in millions)	2021	2020	2019
Cost of prior grants of RSUs, PSUs, SARs and stock options that are amortized over their applicable vesting periods	\$ 1,161	\$ 1,101	\$ 1,141
Accrual of estimated costs of share-based awards to be granted in future periods, predominantly those to full-career eligible employees	1,768	1,350	1,115
Total noncash compensation expense related to employee share-based incentive plans	\$ 2,929	\$ 2,451	\$ 2,256

At December 31, 2021, approximately \$862 million (pretax) of compensation expense related to unvested awards had not yet been charged to net income. That cost is expected to be amortized into compensation expense over a weighted-average period of 1.8 years. The Firm does not capitalize any compensation expense related to share-based compensation awards to employees.

Tax benefits

Income tax benefits (including tax benefits from dividends or dividend equivalents) related to share-based incentive arrangements recognized in the Firm's Consolidated statements of income for the years ended December 31, 2021, 2020 and 2019, were \$957 million, \$837 million and \$895 million, respectively.

Notes to consolidated financial statements

Note 10 – Investment securities

Investment securities consist of debt securities that are classified as AFS or HTM. Debt securities classified as trading assets are discussed in Note 2. Predominantly all of the Firm's AFS and HTM securities are held by Treasury and CIO in connection with its asset-liability management activities.

AFS securities are carried at fair value on the Consolidated balance sheets. Unrealized gains and losses, after any applicable hedge accounting adjustments or allowance for credit losses, are reported in AOCI. The specific identification method is used to determine realized gains and losses on AFS securities, which are included in investment securities gains/(losses) on the Consolidated statements of income. HTM securities, which the Firm has the intent and ability to hold until maturity, are carried at amortized cost, net of allowance for credit losses, on the Consolidated balance sheets.

For both AFS and HTM securities, purchase discounts or premiums are generally amortized into interest income on a level-yield basis over the contractual life of the security. However, premiums on certain callable debt securities are amortized to the earliest call date.

During the second quarter of 2021, the Firm transferred \$104.5 billion of investment securities from AFS to HTM for capital management purposes. AOCI included pretax unrealized gains of \$425 million on the securities at the date of transfer.

Unrealized gains or losses at the date of transfer of these securities continue to be reported in AOCI and are amortized into interest income on a level-yield basis over the remaining life of the securities. This amortization will offset the effect on interest income of the amortization of the premium or discount resulting from the transfer recorded at fair value.

Transfers of securities from AFS to HTM are non-cash transactions and are recorded at fair value.

The amortized costs and estimated fair values of the investment securities portfolio were as follows for the dates indicated.

December 31, (in millions)	2021				2020			
	Amortized cost ^{(b)(c)}	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost ^{(b)(c)}	Gross unrealized gains	Gross unrealized losses	Fair value
Available-for-sale securities								
Mortgage-backed securities:								
U.S. GSEs and government agencies	\$ 72,800	\$ 736	\$ 993	\$ 72,543	\$ 110,979	\$ 2,372	\$ 50	\$ 113,301
Residential:								
U.S.	2,128	38	2	2,164	6,246	224	3	6,467
Non-U.S.	3,882	25	1	3,906	3,751	20	5	3,766
Commercial	4,944	22	17	4,949	2,819	71	34	2,856
Total mortgage-backed securities	83,754	821	1,013	83,562	123,795	2,687	92	126,390
U.S. Treasury and government agencies	178,038	668	1,243	177,463	199,910	2,141	100	201,951
Obligations of U.S. states and municipalities	14,890	972	2	15,860	18,993	1,404	1	20,396
Non-U.S. government debt securities	16,163	92	46	16,209	22,587	354	13	22,928
Corporate debt securities	332	8	19	321	215	4	3	216
Asset-backed securities:								
Collateralized loan obligations	9,674	6	18	9,662	10,055	24	31	10,048
Other	5,403	47	2	5,448	6,174	91	16	6,249
Total available-for-sale securities	308,254	2,614	2,343	308,525	381,729	6,705	256	388,178
Held-to-maturity securities^(a)								
Mortgage-backed securities:								
U.S. GSEs and government agencies	102,556	1,400	853	103,103	107,889	2,968	29	110,828
U.S. Residential	7,316	1	106	7,211	4,345	8	30	4,323
Commercial	3,730	11	54	3,687	2,602	77	–	2,679
Total mortgage-backed securities	113,602	1,412	1,013	114,001	114,836	3,053	59	117,830
U.S. Treasury and government agencies	185,204	169	2,103	183,270	53,184	50	–	53,234
Obligations of U.S. states and municipalities	13,985	453	44	14,394	12,751	519	–	13,270
Asset-backed securities:								
Collateralized loan obligations	48,869	75	22	48,922	21,050	90	2	21,138
Other	2,047	1	7	2,041	–	–	–	–
Total held-to-maturity securities	363,707	2,110	3,189	362,628	201,821	3,712	61	205,472
Total investment securities, net of allowance for credit losses	\$ 671,961	\$ 4,724	\$ 5,532	\$ 671,153	\$ 583,550	\$ 10,417	\$ 317	\$ 593,650

- (a) The Firm purchased \$111.8 billion, \$12.4 billion and \$13.4 billion of HTM securities for the years ended December 31, 2021, 2020 and 2019, respectively.
- (b) The amortized cost of investment securities is reported net of allowance for credit losses of \$42 million and \$78 million at December 31, 2021 and 2020, respectively.
- (c) Excludes \$1.9 billion and \$2.1 billion of accrued interest receivables at December 31, 2021 and 2020, respectively, included in accrued interest and accounts receivables on the Consolidated balance sheets. The Firm generally does not recognize an allowance for credit losses on accrued interest receivables, consistent with its policy to write them off no later than 90 days past due by reversing interest income. The Firm did not reverse through interest income any accrued interest receivables for the years ended December 31, 2021 and 2020.

At December 31, 2021, the investment securities portfolio consisted of debt securities with an average credit rating of AA+ (based upon external ratings where available, and where not available, based primarily upon internal risk ratings). Risk ratings are used to identify the credit quality of securities and differentiate risk within the portfolio. The Firm's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's,

however the quantitative characteristics (e.g., probability of default ("PD") and loss given default ("LGD")) may differ as they reflect internal historical experiences and assumptions. Risk ratings are assigned at acquisition, reviewed on a regular and ongoing basis by Credit Risk Management and adjusted as necessary over the life of the investment for updated information affecting the issuer's ability to fulfill its obligations.

Notes to consolidated financial statements

AFS securities impairment

The following tables present the fair value and gross unrealized losses by aging category for AFS securities at December 31, 2021 and 2020. The tables exclude U.S. Treasury and government agency securities and U.S. GSE and government agency MBS with unrealized losses of \$2.2 billion and \$150 million, at December 31, 2021 and 2020, respectively; changes in the value of these securities are generally driven by changes in interest rates rather than changes in their credit profile given the explicit or implicit guarantees provided by the U.S. government.

December 31, 2021 (in millions)	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more		Total fair value	Total gross unrealized losses
	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses		
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	\$ 303	\$ 1	\$ 45	\$ 1	\$ 348	\$ 2
Non-U.S.	133	1	—	—	133	1
Commercial	2,557	5	349	12	2,906	17
Total mortgage-backed securities	2,993	7	394	13	3,387	20
Obligations of U.S. states and municipalities	120	2	—	—	120	2
Non-U.S. government debt securities	5,060	37	510	9	5,570	46
Corporate debt securities	166	1	46	18	212	19
Asset-backed securities:						
Collateralized loan obligations	8,110	18	208	—	8,318	18
Other	89	—	178	2	267	2
Total available-for-sale securities with gross unrealized losses	\$ 16,538	\$ 65	\$ 1,336	\$ 42	\$ 17,874	\$ 107

December 31, 2020 (in millions)	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more		Total fair value	Total gross unrealized losses
	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses		
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	\$ 562	\$ 3	\$ 32	\$ —	\$ 594	\$ 3
Non-U.S.	2,507	4	235	1	2,742	5
Commercial	699	18	124	16	823	34
Total mortgage-backed securities	3,768	25	391	17	4,159	42
Obligations of U.S. states and municipalities	49	1	—	—	49	1
Non-U.S. government debt securities	2,709	9	968	4	3,677	13
Corporate debt securities	91	3	5	—	96	3
Asset-backed securities:						
Collateralized loan obligations	5,248	18	2,645	13	7,893	31
Other	268	1	685	15	953	16
Total available-for-sale securities with gross unrealized losses	\$ 12,133	\$ 57	\$ 4,694	\$ 49	\$ 16,827	\$ 106

AFS securities are considered impaired if the fair value is less than the amortized cost.

The Firm recognizes impairment losses in earnings if the Firm has the intent to sell the debt security, or if it is more likely than not that the Firm will be required to sell the debt security before recovery of its amortized cost. In these circumstances the impairment loss recognized in investment securities gains/(losses) is equal to the full difference between the amortized cost (net of allowance if applicable) and the fair value of the security.

For impaired debt securities that the Firm has the intent and ability to hold, the securities are evaluated to determine if a credit loss exists. If it is determined that a credit loss exists, that loss is recognized as an allowance for credit losses through the provision for credit losses in the Consolidated Statements of Income, limited by the amount of impairment. Any impairment not due to credit losses is recorded in OCI.

Factors considered in evaluating credit losses include adverse conditions specifically related to the industry, geographic area or financial condition of the issuer or underlying collateral of a security; and payment structure of the security.

When assessing securities issued in a securitization for credit losses, the Firm estimates cash flows considering relevant market and economic data, underlying loan-level data, and structural features of the securitization, such as subordination, excess spread, overcollateralization or other forms of credit enhancement, and compares the losses projected for the underlying collateral ("pool losses") against the level of credit enhancement in the securitization structure to determine whether these features are sufficient to absorb the pool losses, or whether a credit loss exists.

For beneficial interests in securitizations that are rated below "AA" at their acquisition, or that can be contractually prepaid or otherwise settled in such a way that the Firm would not recover substantially all of its recorded investment, the Firm evaluates impairment for credit losses when there is an adverse change in expected cash flows.

Notes to consolidated financial statements

HTM securities – credit risk

Allowance for credit losses

The allowance for credit losses represents expected credit losses over the remaining expected life of HTM securities.

The allowance for credit losses on HTM obligations of U.S. states and municipalities and commercial mortgage-backed securities is calculated by applying statistical credit loss factors (estimated PD and LGD) to the amortized cost. The credit loss factors are derived using a weighted average of five internally developed eight-quarter macroeconomic scenarios, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the forecast period. Refer to Note 13 for further information on the eight-quarter macroeconomic forecast.

The allowance for credit losses on HTM collateralized loan obligations and U.S. residential mortgage-backed securities is calculated as the difference between the amortized cost and the present value of the cash flows expected to be collected, discounted at the security's effective interest rate. These cash flow estimates are developed based on expectations of underlying collateral performance derived using the eight-quarter macroeconomic forecast and the single year straight-line interpolation, as well as considering the structural features of the security.

The application of different inputs and assumptions into the calculation of the allowance for credit losses is subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for credit losses on HTM securities.

Credit quality indicator

The primary credit quality indicator for HTM securities is the risk rating assigned to each security. At both December 31, 2021 and 2020, all HTM securities were rated investment grade and were current and accruing, with approximately 98% rated at least AA+.

Allowance for credit losses on investment securities

The allowance for credit losses on investment securities was \$42 million and \$78 million as of December 31, 2021 and 2020, respectively. The allowance for credit losses on investment securities as of December 31, 2020 included a \$10 million cumulative-effect adjustment to retained earnings upon the adoption of CECL on January 1, 2020.

Selected impacts of investment securities on the Consolidated statements of income

Year ended December 31, (in millions)	2021	2020	2019
Realized gains	\$ 595	\$ 3,080	\$ 650
Realized losses	(940)	(2,278)	(392)
Investment securities gains/ (losses)	\$ (345)	\$ 802	\$ 258
Provision for credit losses	\$ (36)	\$ 68	NA

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

Contractual maturities and yields

The following table presents the amortized cost and estimated fair value at December 31, 2021, of JPMorgan Chase's investment securities portfolio by contractual maturity.

By remaining maturity December 31, 2021 (in millions)	Due in one year or less	Due after one year through five years	Due after five years through 10 years	Due after 10 years ^(b)	Total
Available-for-sale securities					
Mortgage-backed securities					
Amortized cost	\$ 8	\$ 3,771	\$ 4,823	\$ 75,155	\$ 83,757
Fair value	8	3,783	5,094	74,677	83,562
Average yield ^(a)	0.52 %	1.53 %	1.75 %	2.25 %	2.19 %
U.S. Treasury and government agencies					
Amortized cost	\$ 7,774	\$ 146,817	\$ 14,618	\$ 8,829	\$ 178,038
Fair value	7,802	146,050	14,554	9,057	177,463
Average yield ^(a)	1.01 %	0.55 %	0.61 %	0.54 %	0.57 %
Obligations of U.S. states and municipalities					
Amortized cost	\$ 13	\$ 142	\$ 1,285	\$ 13,450	\$ 14,890
Fair value	13	146	1,346	14,355	15,860
Average yield ^(a)	4.06 %	4.38 %	4.84 %	4.89 %	4.88 %
Non-U.S. government debt securities					
Amortized cost	\$ 7,211	\$ 5,491	\$ 3,461	\$ —	\$ 16,163
Fair value	7,224	5,532	3,453	—	16,209
Average yield ^(a)	2.34 %	2.53 %	1.09 %	— %	2.14 %
Corporate debt securities					
Amortized cost	\$ —	\$ 301	\$ 31	\$ —	\$ 332
Fair value	—	290	31	—	321
Average yield ^(a)	— %	10.03 %	1.61 %	— %	9.25 %
Asset-backed securities					
Amortized cost	\$ 2,500	\$ 799	\$ 3,369	\$ 8,409	\$ 15,077
Fair value	2,500	800	3,372	8,438	15,110
Average yield ^(a)	1.35 %	1.88 %	1.25 %	1.28 %	1.32 %
Total available-for-sale securities					
Amortized cost	\$ 17,506	\$ 157,321	\$ 27,587	\$ 105,843	\$ 308,257
Fair value	17,547	156,601	27,850	106,527	308,525
Average yield ^(a)	1.61 %	0.67 %	1.15 %	2.37 %	1.35 %
Held-to-maturity securities					
Mortgage-backed securities					
Amortized cost	\$ —	\$ 1,322	\$ 11,495	\$ 100,791	\$ 113,608
Fair value	—	1,338	11,814	100,849	114,001
Average yield ^(a)	— %	1.76 %	2.43 %	2.83 %	2.78 %
U.S. Treasury and government agencies					
Amortized cost	\$ 25,706	\$ 92,845	\$ 66,653	\$ —	\$ 185,204
Fair value	25,675	91,727	65,868	—	183,270
Average yield ^(a)	0.54 %	0.74 %	1.26 %	— %	0.90 %
Obligations of U.S. states and municipalities					
Amortized cost	\$ 35	\$ 76	\$ 1,192	\$ 12,715	\$ 14,018
Fair value	35	76	1,240	13,043	14,394
Average yield ^(a)	3.72 %	2.72 %	3.74 %	3.83 %	3.82 %
Asset-backed securities					
Amortized cost	\$ —	\$ —	\$ 13,402	\$ 37,514	\$ 50,916
Fair value	—	—	13,449	37,514	50,963
Average yield ^(a)	— %	— %	1.18 %	1.30 %	1.27 %
Total held-to-maturity securities					
Amortized cost	\$ 25,741	\$ 94,243	\$ 92,742	\$ 151,020	\$ 363,746
Fair value	25,710	93,141	92,371	151,406	362,628
Average yield ^(a)	0.54 %	0.76 %	1.43 %	2.53 %	1.65 %

(a) Average yield is computed using the effective yield of each security owned at the end of the period, weighted based on the amortized cost of each security. The effective yield considers the contractual coupon, amortization of premiums and accretion of discounts, and the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable. The effective yield excludes unscheduled principal prepayments; and accordingly, actual maturities of securities may differ from their contractual or expected maturities as certain securities may be prepaid. However, for certain callable debt securities, the average yield is calculated to the earliest call date.

(b) Substantially all of the Firm's U.S. residential MBS and collateralized mortgage obligations are due in 10 years or more, based on contractual maturity. The estimated weighted-average life, which reflects anticipated future prepayments, is approximately 6 years for agency residential MBS, 4 years for agency residential collateralized mortgage obligations and 3 years for nonagency residential collateralized mortgage obligations.

Note 11 – Securities financing activities

JPMorgan Chase enters into resale, repurchase, securities borrowed and securities loaned agreements (collectively, “securities financing agreements”) primarily to finance the Firm’s inventory positions, acquire securities to cover short sales, accommodate customers’ financing needs, settle other securities obligations and to deploy the Firm’s excess cash.

Securities financing agreements are treated as collateralized financings on the Firm’s Consolidated balance sheets. Where appropriate under applicable accounting guidance, securities financing agreements with the same counterparty are reported on a net basis. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. Fees received and paid in connection with securities financing agreements are recorded over the life of the agreement in interest income and interest expense on the Consolidated statements of income.

The Firm has elected the fair value option for certain securities financing agreements. Refer to Note 3 for further information regarding the fair value option. The securities financing agreements for which the fair value option has been elected are reported within securities purchased under resale agreements, securities loaned or sold under repurchase agreements, and securities borrowed on the Consolidated balance sheets. Generally, for agreements carried at fair value, current-period interest accruals are recorded within interest income and interest expense, with changes in fair value reported in principal transactions revenue. However, for financial instruments containing embedded derivatives that would be separately accounted for in accordance with accounting guidance for hybrid instruments, all changes in fair value, including any interest elements, are reported in principal transactions revenue.

Securities financing agreements not elected under the fair value option are measured at amortized cost. As a result of the Firm’s credit risk mitigation practices described below, the Firm did not hold any allowance for credit losses with respect to resale and securities borrowed arrangements as of December 31, 2021 and 2020.

Credit risk mitigation practices

Securities financing agreements expose the Firm primarily to credit and liquidity risk. To manage these risks, the Firm monitors the value of the underlying securities (predominantly high-quality securities collateral, including government-issued debt and U.S. GSEs and government agencies MBS) that it has received from or provided to its counterparties compared to the value of cash proceeds and exchanged collateral, and either requests additional collateral or returns securities or collateral when appropriate. Margin levels are initially established based upon the counterparty, the type of underlying securities, and the permissible collateral, and are monitored on an ongoing basis.

In resale and securities borrowed agreements, the Firm is exposed to credit risk to the extent that the value of the securities received is less than initial cash principal advanced and any collateral amounts exchanged. In repurchase and securities loaned agreements, credit risk exposure arises to the extent that the value of underlying securities advanced exceeds the value of the initial cash principal received, and any collateral amounts exchanged.

Additionally, the Firm typically enters into master netting agreements and other similar arrangements with its counterparties, which provide for the right to liquidate the underlying securities and any collateral amounts exchanged in the event of a counterparty default. It is also the Firm’s policy to take possession, where possible, of the securities underlying resale and securities borrowed agreements. Refer to Note 29 for further information regarding assets pledged and collateral received in securities financing agreements.

The table below summarizes the gross and net amounts of the Firm's securities financing agreements, as of December 31, 2021 and 2020. When the Firm has obtained an appropriate legal opinion with respect to a master netting agreement with a counterparty and where other relevant netting criteria under U.S. GAAP are met, the Firm nets, on the Consolidated balance sheets, the balances outstanding under its securities financing agreements with the same counterparty. In addition, the Firm exchanges securities and/or cash collateral with its counterparty to reduce the economic exposure with the counterparty, but such collateral is not eligible for net Consolidated balance sheet presentation. Where the Firm has obtained an appropriate legal opinion with respect to the counterparty master netting agreement, such collateral, along with

securities financing balances that do not meet all these relevant netting criteria under U.S. GAAP, is presented in the table below as "Amounts not nettable on the Consolidated balance sheets," and reduces the "Net amounts" presented. Where a legal opinion has not been either sought or obtained, the securities financing balances are presented gross in the "Net amounts" below. In transactions where the Firm is acting as the lender in a securities-for-securities lending agreement and receives securities that can be pledged or sold as collateral, the Firm recognizes the securities received at fair value within other assets and the obligation to return those securities within accounts payable and other liabilities on the Consolidated balance sheets.

		2021				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets ^(b)	Net amounts ^(c)	
Assets						
Securities purchased under resale agreements	\$ 604,724	\$ (343,093)	\$ 261,631	\$ (245,588)	\$ 16,043	
Securities borrowed	250,333	(44,262)	206,071	(154,599)	51,472	
Liabilities						
Securities sold under repurchase agreements	\$ 532,899	\$ (343,093)	\$ 189,806	\$ (166,456)	\$ 23,350	
Securities loaned and other ^(a)	52,610	(44,262)	8,348	(8,133)	215	
		2020				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets ^(b)	Net amounts ^(c)	
Assets						
Securities purchased under resale agreements	\$ 666,467	\$ (370,183)	\$ 296,284	\$ (273,206)	\$ 23,078	
Securities borrowed	193,700	(33,065)	160,635	(115,219)	45,416	
Liabilities						
Securities sold under repurchase agreements	\$ 578,060	\$ (370,183)	\$ 207,877	\$ (191,980)	\$ 15,897	
Securities loaned and other ^(a)	41,366	(33,065)	8,301	(8,257)	44	

- (a) Includes securities-for-securities lending agreements of \$5.6 billion and \$3.4 billion at December 31, 2021 and 2020, respectively, accounted for at fair value, where the Firm is acting as lender.
- (b) In some cases, collateral exchanged with a counterparty exceeds the net asset or liability balance with that counterparty. In such cases, the amounts reported in this column are limited to the related net asset or liability with that counterparty.
- (c) Includes securities financing agreements that provide collateral rights, but where an appropriate legal opinion with respect to the master netting agreement has not been either sought or obtained. At December 31, 2021 and 2020, included \$13.9 billion and \$17.0 billion, respectively, of securities purchased under resale agreements; \$46.4 billion and \$42.1 billion, respectively, of securities borrowed; \$21.6 billion and \$14.5 billion, respectively, of securities sold under repurchase agreements; and \$198 million and \$8 million, respectively, of securities loaned and other.

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The tables below present as of December 31, 2021 and 2020 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

December 31, (in millions)	Gross liability balance			
	2021		2020	
	Securities sold under repurchase agreements	Securities loaned and other	Securities sold under repurchase agreements	Securities loaned and other
Mortgage-backed securities:				
U.S. GSEs and government agencies	\$ 37,046	\$ —	\$ 56,744	\$ —
Residential - nonagency	1,508	—	1,016	—
Commercial - nonagency	1,463	—	855	—
U.S. Treasury, GSEs and government agencies	241,578	358	315,834	143
Obligations of U.S. states and municipalities	1,916	7	1,525	2
Non-U.S. government debt	174,971	1,572	157,563	1,730
Corporate debt securities	38,180	1,619	22,849	1,864
Asset-backed securities	1,211	—	694	—
Equity securities	35,026	49,054	20,980	37,627
Total	\$ 532,899	\$ 52,610	\$ 578,060	\$ 41,366

2021 (in millions)	Remaining contractual maturity of the agreements				
	Overnight and continuous	Up to 30 days	30 - 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	\$ 195,035	\$ 231,171	\$ 47,201	\$ 59,492	\$ 532,899
Total securities loaned and other	50,034	1,701	—	875	52,610

2020 (in millions)	Remaining contractual maturity of the agreements				
	Overnight and continuous	Up to 30 days	30 - 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	\$ 238,667	\$ 230,980	\$ 70,777	\$ 37,636	\$ 578,060
Total securities loaned and other	37,887	1,647	500	1,332	41,366

Transfers not qualifying for sale accounting

At December 31, 2021 and 2020, the Firm held \$440 million and \$598 million, respectively, of financial assets for which the rights have been transferred to third parties; however, the transfers did not qualify as a sale in accordance with U.S. GAAP. These transfers have been recognized as collateralized financing transactions. The transferred assets are recorded in trading assets and loans, and the corresponding liabilities are recorded predominantly in short-term borrowings on the Consolidated balance sheets.

Note 12 – Loans

Loan accounting framework

The accounting for a loan depends on management's strategy for the loan. The Firm accounts for loans based on the following categories:

- Originated or purchased loans held-for-investment (i.e., "retained")
- Loans held-for-sale
- Loans at fair value

The following provides a detailed accounting discussion of the Firm's loans by category:

Loans held-for-investment

Originated or purchased loans held-for-investment, including PCD, are recorded at amortized cost, reflecting the principal amount outstanding, net of the following: unamortized deferred loan fees, costs, premiums or discounts; charge-offs; collection of cash; and foreign exchange. Credit card loans also include billed finance charges and fees.

Interest income

Interest income on performing loans held-for-investment is accrued and recognized as interest income at the contractual rate of interest. Purchase price discounts or premiums, as well as net deferred loan fees or costs, are amortized into interest income over the contractual life of the loan as an adjustment of yield.

The Firm classifies accrued interest on loans, including accrued but unbilled interest on credit card loans, in accrued interest and accounts receivables on the Consolidated balance sheets. For credit card loans, accrued interest once billed is then recognized in the loan balances, with the related allowance recorded in the allowance for credit losses. Changes in the allowance for credit losses on accrued interest on credit card loans are recognized in the provision for credit losses and charge-offs are recognized by reversing interest income. Expected losses related to accrued interest on certain performing, modified loans to borrowers impacted by COVID-19 are considered in the Firm's allowance for loan losses. For other loans, the Firm generally does not recognize an allowance for credit losses on accrued interest receivables, consistent with its policy to write them off no later than 90 days past due by reversing interest income.

Nonaccrual loans

Nonaccrual loans are those on which the accrual of interest has been suspended. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status and considered nonperforming when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest has been in default for a period of 90 days or more, unless the loan is both well-secured and in the process of collection. A loan is determined to be past due when the minimum payment is not received from the borrower by the contractually specified due date or for

certain loans (e.g., residential real estate loans), when a monthly payment is due and unpaid for 30 days or more. Finally, collateral-dependent loans are typically maintained on nonaccrual status.

On the date a loan is placed on nonaccrual status, all interest accrued but not collected is reversed against interest income. In addition, the amortization of deferred amounts is suspended. Interest income on nonaccrual loans may be recognized as cash interest payments are received (i.e., on a cash basis) if the recorded loan balance is deemed fully collectible; however, if there is doubt regarding the ultimate collectibility of the recorded loan balance, all interest cash receipts are applied to reduce the carrying value of the loan (the cost recovery method). For consumer loans, application of this policy typically results in the Firm recognizing interest income on nonaccrual consumer loans on a cash basis.

A loan may be returned to accrual status when repayment is reasonably assured and there has been demonstrated performance under the terms of the loan or, if applicable, the terms of the restructured loan.

As permitted by regulatory guidance, credit card loans are generally exempt from being placed on nonaccrual status; accordingly, interest and fees related to credit card loans continue to accrue until the loan is charged off or paid in full.

Allowance for loan losses

The allowance for loan losses represents the estimated expected credit losses in the held-for-investment loan portfolio at the balance sheet date and is recognized on the balance sheet as a contra asset, which brings the amortized cost to the net carrying value. Changes in the allowance for loan losses are recorded in the provision for credit losses on the Firm's Consolidated statements of income. Refer to Note 13 for further information on the Firm's accounting policies for the allowance for loan losses.

Charge-offs

Consumer loans are generally charged off or charged down to the lower of the amortized cost or the net realizable value of the underlying collateral (i.e., fair value less estimated costs to sell), with an offset to the allowance for loan losses, upon reaching specified stages of delinquency in accordance with standards established by the FFIEC. Residential real estate loans, unmodified credit card loans and scored business banking loans are generally charged off no later than 180 days past due. Scored auto and modified credit card loans are charged off no later than 120 days past due.

Certain consumer loans are charged off or charged down to their net realizable value earlier than the FFIEC charge-off standards in certain circumstances as follows:

- Loans modified in a TDR that are determined to be collateral-dependent.

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- Loans to borrowers who have experienced an event that suggests a loss is either known or highly certain are subject to accelerated charge-off standards (e.g., residential real estate and auto loans are charged off or charged down within 60 days of receiving notification of a bankruptcy filing).
- Auto loans upon repossession of the automobile.

Other than in certain limited circumstances, the Firm typically does not recognize charge-offs on the government-guaranteed portion of loans.

Wholesale loans are charged off when it is highly certain that a loss has been realized. The determination of whether to recognize a charge-off includes many factors, including the prioritization of the Firm's claim in bankruptcy, expectations of the workout/restructuring of the loan and valuation of the borrower's equity or the loan collateral.

When a loan is charged down to the lower of its amortized cost or the estimated net realizable value of the underlying collateral, the determination of the fair value of the collateral depends on the type of collateral (e.g., securities, real estate). In cases where the collateral is in the form of liquid securities, the fair value is based on quoted market prices or broker quotes. For illiquid securities or other financial assets, the fair value of the collateral is generally estimated using a discounted cash flow model.

For residential real estate loans, collateral values are based upon external valuation sources. When it becomes likely that a borrower is either unable or unwilling to pay, the Firm utilizes a broker's price opinion, appraisal and/or an automated valuation model of the home based on an exterior-only valuation ("exterior opinions"), which is then updated at least every 12 months, or more frequently depending on various market factors. As soon as practicable after the Firm receives the property in satisfaction of a debt (e.g., by taking legal title or physical possession), the Firm generally obtains an appraisal based on an inspection that includes the interior of the home ("interior appraisals"). Exterior opinions and interior appraisals are discounted based upon the Firm's experience with actual liquidation values as compared with the estimated values provided by exterior opinions and interior appraisals, considering state-specific factors.

For commercial real estate loans, collateral values are generally based on appraisals from internal and external valuation sources. Collateral values are typically updated every six to twelve months, either by obtaining a new appraisal or by performing an internal analysis, in accordance with the Firm's policies. The Firm also considers both borrower- and market-specific factors, which may result in obtaining appraisal updates or broker price opinions at more frequent intervals.

Loans held-for-sale

Loans held-for-sale are measured at the lower of cost or fair value, with valuation changes recorded in noninterest revenue. For consumer loans, the valuation is performed on a portfolio basis. For wholesale loans, the valuation is performed on an individual loan basis.

Interest income on loans held-for-sale is accrued and recognized based on the contractual rate of interest.

Loan origination fees or costs and purchase price discounts or premiums are deferred in a contra loan account until the related loan is sold. The deferred fees or costs and discounts or premiums are an adjustment to the basis of the loan and therefore are included in the periodic determination of the lower of cost or fair value adjustments and/or the gain or loss recognized at the time of sale.

Because these loans are recognized at the lower of cost or fair value, the Firm's allowance for loan losses and charge-off policies do not apply to these loans. However, loans held-for-sale are subject to the nonaccrual policies described above.

Loans at fair value

Loans for which the fair value option has been elected are measured at fair value, with changes in fair value recorded in noninterest revenue.

Interest income on these loans is accrued and recognized based on the contractual rate of interest. Changes in fair value are recognized in noninterest revenue. Loan origination fees are recognized upfront in noninterest revenue. Loan origination costs are recognized in the associated expense category as incurred.

Because these loans are recognized at fair value, the Firm's allowance for loan losses and charge-off policies do not apply to these loans. However, loans at fair value are subject to the nonaccrual policies described above.

Refer to Note 3 for further information on the Firm's elections of fair value accounting under the fair value option. Refer to Note 2 and Note 3 for further information on loans carried at fair value and classified as trading assets.

Loan classification changes

Loans in the held-for-investment portfolio that management decides to sell are transferred to the held-for-sale portfolio at the lower of cost or fair value on the date of transfer. Credit-related losses are charged against the allowance for loan losses; non-credit related losses such as those due to changes in interest rates or foreign currency exchange rates are recognized in noninterest revenue.

In the event that management decides to retain a loan in the held-for-sale portfolio, the loan is transferred to the held-for-investment portfolio at amortized cost on the date of transfer. These loans are subsequently assessed for impairment based on the Firm's allowance methodology. Refer to Note 13 for a further discussion of the methodologies used in establishing the Firm's allowance for loan losses.

Loan modifications

The Firm seeks to modify certain loans in conjunction with its loss mitigation activities. Through the modification, JPMorgan Chase grants one or more concessions to a borrower who is experiencing financial difficulty in order to minimize the Firm's economic loss and avoid foreclosure or repossession of the collateral, and to ultimately maximize payments received by the Firm from the borrower. The concessions granted vary by program and by borrower-specific characteristics, and may include interest rate reductions, term extensions, payment delays, principal forgiveness, or the acceptance of equity or other assets in lieu of payments. Such modifications are accounted for and reported as TDRs. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

Loans, except for credit card loans, modified in a TDR are generally placed on nonaccrual status, although in many cases such loans were already on nonaccrual status prior to modification. These loans may be returned to performing status (the accrual of interest is resumed) if the following criteria are met: (i) the borrower has performed under the modified terms for a minimum of six months and/or six payments, and (ii) the Firm has an expectation that repayment of the modified loan is reasonably assured based on, for example, the borrower's debt capacity and level of future earnings, collateral values, LTV ratios, and other current market considerations. In certain limited and well-defined circumstances in which the loan is current at the modification date, such loans are not placed on nonaccrual status at the time of modification.

Loans modified in TDRs are generally measured for impairment using the Firm's established asset-specific allowance methodology, which considers the expected re-default rates for the modified loans. A loan modified in a TDR generally remains subject to the asset-specific component of the allowance throughout its remaining life, regardless of whether the loan is performing and has been returned to accrual status. Refer to Note 13 for further discussion of the methodology used to estimate the Firm's asset-specific allowance.

The Firm granted various forms of assistance to customers and clients impacted by the COVID-19 pandemic, including payment deferrals and covenant modifications. The majority of the Firm's COVID-19 related loan modifications have not been considered TDRs because:

- they represent short-term or other insignificant modifications, whether under the Firm's regular loan modification assessments or as permitted by regulatory guidance, or
- the Firm elected to suspend TDR accounting guidance under the option provided by the CARES Act, as extended by the Consolidated Appropriations Act and which expired on January 1, 2022.

To the extent that certain modifications did not meet any of the above criteria, the Firm accounted for them as TDRs.

As permitted by regulatory guidance, the Firm did not place loans with deferrals granted due to COVID-19 on nonaccrual status where such loans were not otherwise reportable as nonaccrual. The Firm considered expected losses of principal and accrued interest associated with all COVID-19 related loan modifications in its allowance for credit losses.

Assistance provided in response to the COVID-19 pandemic could delay the recognition of delinquencies, nonaccrual status, and net charge-offs for those customers who would have otherwise moved into past due or nonaccrual status.

Foreclosed property

The Firm acquires property from borrowers through loan restructurings, workouts, and foreclosures. Property acquired may include real property (e.g., residential real estate, land, and buildings) and commercial and personal property (e.g., automobiles, aircraft, railcars, and ships).

The Firm recognizes foreclosed property upon receiving assets in satisfaction of a loan (e.g., by taking legal title or physical possession). For loans collateralized by real property, the Firm generally recognizes the asset received at foreclosure sale or upon the execution of a deed in lieu of foreclosure transaction with the borrower. Foreclosed assets are reported in other assets on the Consolidated balance sheets and initially recognized at fair value less estimated costs to sell. Each quarter the fair value of the acquired property is reviewed and adjusted, if necessary, to the lower of cost or fair value. Subsequent adjustments to fair value are charged/credited to noninterest revenue. Operating expense, such as real estate taxes and maintenance, are charged to other expense.

Foreclosures have resumed after having been temporarily suspended in response to the COVID-19 pandemic.

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Loan portfolio

The Firm's loan portfolio is divided into three portfolio segments, which are the same segments used by the Firm to determine the allowance for loan losses: Consumer, excluding credit card; Credit card; and Wholesale. Within each portfolio segment the Firm monitors and assesses the credit risk in the following classes of loans, based on the risk characteristics of each loan class.

Consumer, excluding credit card	Credit card	Wholesale ^{(c)(d)}
<ul style="list-style-type: none"> Residential real estate^(a) Auto and other^(b) 	<ul style="list-style-type: none"> Credit card loans 	<ul style="list-style-type: none"> Secured by real estate Commercial and industrial Other^(e)

(a) Includes scored mortgage and home equity loans held in CCB and AWM, and scored mortgage loans held in CIB and Corporate.

(b) Includes scored auto and business banking loans and overdrafts.

(c) Includes loans held in CIB, CB, AWM, Corporate as well as risk-rated loans held in CCB, including business banking and auto dealer loans for which the wholesale methodology is applied when determining the allowance for loan losses.

(d) The wholesale portfolio segment's classes align with loan classifications as defined by the bank regulatory agencies, based on the loan's collateral, purpose, and type of borrower.

(e) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly Global Private Bank clients within AWM). Refer to Note 14 for more information on SPEs.

The following tables summarize the Firm's loan balances by portfolio segment.

December 31, 2021 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total ^{(a)(b)}
Retained	\$ 295,556	\$ 154,296	\$ 560,354	\$ 1,010,206
Held-for-sale	1,287	—	7,401	8,688
At fair value	26,463	—	32,357	58,820
Total	\$ 323,306	\$ 154,296	\$ 600,112	\$ 1,077,714

December 31, 2020 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total ^{(a)(b)}
Retained	\$ 302,127	\$ 143,432	\$ 514,947	\$ 960,506
Held-for-sale	1,305	784	5,784	7,873
At fair value	15,147	—	29,327	44,474
Total	\$ 318,579	\$ 144,216	\$ 550,058	\$ 1,012,853

(a) Excludes \$2.7 billion and \$2.9 billion of accrued interest receivables at December 31, 2021 and 2020, respectively. The Firm wrote off accrued interest receivables of \$56 million and \$121 million for the years ended December 31, 2021 and 2020, respectively.

(b) Loans (other than those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2021 and 2020.

The following tables provide information about the carrying value of retained loans purchased, sold and reclassified to held-for-sale during the periods indicated. Loans that were reclassified to held-for-sale and sold in a subsequent period are excluded from the sales line of this table.

Year ended December 31, (in millions)	2021			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	\$ 515 ^{(b)(c)}	\$ —	\$ 1,122	\$ 1,637
Sales	799	—	31,022	31,821
Retained loans reclassified to held-for-sale ^(a)	1,225	—	2,178	3,403

Year ended December 31, (in millions)	2020			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	\$ 3,474 ^{(b)(c)}	\$ —	\$ 1,159	\$ 4,633
Sales	352	—	17,916	18,268
Retained loans reclassified to held-for-sale ^(a)	2,084	787	1,580	4,451

Year ended December 31, (in millions)	2019			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	\$ 1,282 ^{(b)(c)}	\$ —	\$ 1,291	\$ 2,573
Sales	30,474	—	23,445	53,919
Retained loans reclassified to held-for-sale ^(a)	9,188	—	2,371	11,559

(a) Reclassifications of loans to held-for-sale are non-cash transactions.

(b) Predominantly includes purchases of residential real estate loans, including the Firm's voluntary repurchases of certain delinquent loans from loan pools as permitted by Government National Mortgage Association ("Ginnie Mae") guidelines for the years ended December 31, 2021, 2020 and 2019. The Firm typically elects to repurchase these delinquent loans as it continues to service them and/or manage the foreclosure process in accordance with applicable requirements of Ginnie Mae, FHA, RHS, and/or VA.

(c) Excludes purchases of retained loans of \$25.8 billion, \$16.3 billion and \$16.6 billion for the years ended December 31, 2021, 2020 and 2019, respectively, which are predominantly sourced through the correspondent origination channel and underwritten in accordance with the Firm's standards. The amount of purchases of retained loans at December 31, 2020 has been revised to conform with the current presentation.

Gains and losses on sales of loans

Net gains/(losses) on sales of loans and lending-related commitments (including adjustments to record loans and lending-related commitments held-for-sale at the lower of cost or fair value) recognized in noninterest revenue was \$261 million for the year ended December 31, 2021 of which \$253 million was related to loans. Net gains/(losses) on sales of loans and lending-related commitments was \$(43) million for the year ended December 31, 2020 of which \$(36) million was related to loans. Net gains on sales of loans was \$394 million for the year ended December 31, 2019. In addition, the sale of loans may also result in write downs, recoveries or changes in the allowance recognized in the provision for credit losses.

Consumer, excluding credit card loan portfolio

Consumer loans, excluding credit card loans, consist primarily of scored residential mortgages, home equity loans and lines of credit, auto and business banking loans, with a focus on serving the prime consumer credit market. The portfolio also includes home equity loans secured by junior liens, prime mortgage loans with an interest-only payment period, and certain payment-option loans that may result in negative amortization.

The following table provides information about retained consumer loans, excluding credit card, by class.

December 31, (in millions)	2021	2020
Residential real estate	\$ 224,795	\$ 225,302
Auto and other ^(a)	70,761	76,825
Total retained loans	\$ 295,556	\$ 302,127

(a) At December 31, 2021 and 2020, included \$5.4 billion and \$19.2 billion of loans, respectively, in Business Banking under the PPP.

Delinquency rates are the primary credit quality indicator for consumer loans. Loans that are more than 30 days past due provide an early warning of borrowers who may be experiencing financial difficulties and/or who may be unable or unwilling to repay the loan. As the loan continues to age, it becomes more clear whether the borrower is likely to be unable or unwilling to pay. In the case of residential real estate loans, late-stage delinquencies (greater than 150 days past due) are a strong indicator of loans that will ultimately result in a foreclosure or similar liquidation transaction. In addition to delinquency rates, other credit quality indicators for consumer loans vary based on the class of loan, as follows:

- For residential real estate loans, the current estimated LTV ratio, or the combined LTV ratio in the case of junior lien loans, is an indicator of the potential loss severity in the event of default. Additionally, LTV or combined LTV ratios can provide insight into a borrower's continued willingness to pay, as the delinquency rate of high-LTV loans tends to be greater than that for loans where the borrower has equity in the collateral. The geographic distribution of the loan collateral also provides insight as to the credit quality of the portfolio, as factors such as the regional economy, home price changes and specific events such as natural disasters, will affect credit quality. The borrower's current or "refreshed" FICO score is a secondary credit quality indicator for certain loans, as FICO scores are an indication of the borrower's credit payment history. Thus, a loan to a borrower with a low FICO score (less than 660) is considered to be of higher risk than a loan to a borrower with a higher FICO score. Further, a loan to a borrower with a high LTV ratio and a low FICO score is at greater risk of default than a loan to a borrower that has both a high LTV ratio and a high FICO score.
- For scored auto and business banking loans, geographic distribution is an indicator of the credit performance of the portfolio. Similar to residential real estate loans, geographic distribution provides insights into the portfolio performance based on regional economic activity and events.

Residential real estate

The following tables provide information on delinquency, which is the primary credit quality indicator for retained residential real estate loans.

December 31, 2021									
(in millions, except ratios)	Term loans by origination year ^(d)						Revolving loans		Total
	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	
Loan delinquency^{(a)(b)}									
Current	\$ 68,742	\$ 48,334	\$ 18,428	\$ 7,929	\$ 11,684	\$ 49,147	\$ 6,392	\$ 11,807	\$ 222,463
30-149 days past due	13	23	27	27	22	578	11	182	883
150 or more days past due	—	11	21	25	33	1,069	6	284	1,449
Total retained loans	\$ 68,755	\$ 48,368	\$ 18,476	\$ 7,981	\$ 11,739	\$ 50,794	\$ 6,409	\$ 12,273	\$ 224,795
% of 30+ days past due to total retained loans ^(c)	0.02 %	0.07 %	0.26 %	0.65 %	0.47 %	3.18 %	0.27 %	3.80 %	1.02 %

December 31, 2020									
(in millions, except ratios)	Term loans by origination year ^(d)						Revolving loans		Total
	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	
Loan delinquency^{(a)(b)}									
Current	\$ 56,576	^(e) \$ 31,820	\$ 13,900	\$ 20,410	\$ 27,978	\$ 49,218	^(e) \$ 7,902	^(e) \$ 15,260	^(e) \$ 223,064
30-149 days past due	9	25	20	22	29	674	21	245	1,045
150 or more days past due	3	14	10	18	18	844	22	264	1,193
Total retained loans	\$ 56,588	\$ 31,859	\$ 13,930	\$ 20,450	\$ 28,025	\$ 50,736	\$ 7,945	\$ 15,769	\$ 225,302
% of 30+ days past due to total retained loans ^(c)	0.02 %	0.12 %	0.22 %	0.20 %	0.17 %	2.91 %	^(e) 0.54 %	^(e) 3.23 %	^(e) 0.98 %

(a) Individual delinquency classifications include mortgage loans insured by U.S. government agencies as follows: current included \$35 million and \$36 million; 30-149 days past due included \$11 million and \$16 million; and 150 or more days past due included \$20 million and \$24 million at December 31, 2021 and 2020, respectively.

(b) At December 31, 2021 and 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.

(c) At December 31, 2021 and 2020, residential real estate loans excluded mortgage loans insured by U.S. government agencies of \$31 million and \$40 million, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.

(d) Purchased loans are included in the year in which they were originated.

(e) Prior-period amounts have been revised to conform with the current presentation.

Approximately 37% of the total revolving loans are senior lien loans; the remaining balance are junior lien loans. The lien position the Firm holds is considered in the Firm's allowance for credit losses. Revolving loans that have been converted to term loans have higher delinquency rates than those that are still within the revolving period. That is primarily because the fully-amortizing payment that is generally required for those products is higher than the minimum payment options available for revolving loans within the revolving period.

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Nonaccrual loans and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained residential real estate loans.

(in millions, except weighted-average data)	December 31, 2021		December 31, 2020	
Nonaccrual loans ^{(a)(b)(c)(d)}	\$	4,759	\$	5,313
90 or more days past due and government guaranteed ^(e)		24		33
Current estimated LTV ratios^{(f)(g)(h)(i)}				
Greater than 125% and refreshed FICO scores:				
Equal to or greater than 660	\$	2	\$	6
Less than 660		2		12
101% to 125% and refreshed FICO scores:				
Equal to or greater than 660		37		38
Less than 660		15		44
80% to 100% and refreshed FICO scores:				
Equal to or greater than 660		2,701		2,177
Less than 660		89		239
Less than 80% and refreshed FICO scores:				
Equal to or greater than 660		209,295		208,238
Less than 660		9,658		11,980
No FICO/LTV available		2,930		2,492
U.S. government-guaranteed		66		76
Total retained loans	\$	224,795	\$	225,302
Weighted average LTV ratio ^{(f)(i)}		50 %		54 %
Weighted average FICO ^{(g)(i)}		765		763
Geographic region^(k)				
California	\$	71,383	\$	73,444
New York		32,545		32,287
Florida		16,182		13,981
Texas		13,865		13,773
Illinois		11,565		13,130
Colorado		8,885		8,235
Washington		8,292		7,917
New Jersey		6,832		7,227
Massachusetts		6,105		5,784
Connecticut		5,242		5,024
All other ^(l)		43,899		44,500
Total retained loans	\$	224,795	\$	225,302

- (a) Includes collateral-dependent residential real estate loans that are charged down to the fair value of the underlying collateral less costs to sell. The Firm reports, in accordance with regulatory guidance, residential real estate loans that have been discharged under Chapter 7 bankruptcy and not reaffirmed by the borrower ("Chapter 7 loans") as collateral-dependent nonaccrual TDRs, regardless of their delinquency status. At December 31, 2021, approximately 7% of Chapter 7 residential real estate loans were 30 days or more past due.
- (b) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to the charge down, the related allowance may be negative.
- (c) Interest income on nonaccrual loans recognized on a cash basis was \$172 million and \$161 million for the years ended December 31, 2021 and 2020, respectively.
- (d) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 payment related deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.
- (e) These balances are excluded from nonaccrual loans as the loans are guaranteed by U.S. government agencies. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting agreed-upon servicing guidelines. At December 31, 2021 and 2020, these balances were no longer accruing interest based on the agreed-upon servicing guidelines. There were no loans that were not guaranteed by U.S. government agencies that are 90 or more days past due and still accruing interest at December 31, 2021 and 2020.
- (f) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.
- (g) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Firm on at least a quarterly basis.
- (h) At December 31, 2021 and 2020, included residential real estate loans, primarily held in LLCs in AWM that did not have a refreshed FICO score. These loans have been included in a FICO band based on management's estimation of the borrower's credit quality.
- (i) Prior-period amounts have been revised to conform with the current presentation.
- (j) Excludes loans with no FICO and/or LTV data available.
- (k) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2021.
- (l) At December 31, 2021 and 2020, included mortgage loans insured by U.S. government agencies of \$66 million and \$76 million, respectively. These amounts have been excluded from the geographic regions presented based upon the government guarantee.

Loan modifications

Modifications of residential real estate loans, where the Firm grants concessions to borrowers who are experiencing financial difficulty are generally accounted for and reported as TDRs. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs nor are loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act. The carrying value of new TDRs was \$866 million, \$819 million and \$490 million for the years ended December 31, 2021, 2020 and 2019, respectively. There were no additional commitments to lend to borrowers whose residential real estate loans have been modified in TDRs.

Nature and extent of modifications

The Firm's proprietary modification programs as well as government programs, including U.S. GSE programs, generally provide various concessions to financially troubled borrowers including, but not limited to, interest rate reductions, term or payment extensions and delays of principal and/or interest payments that would otherwise have been required under the terms of the original agreement. The following table provides information about how residential real estate loans were modified in TDRs under the Firm's loss mitigation programs described above during the periods presented. This table excludes Chapter 7 loans where the sole concession granted is the discharge of debt, loans with short-term or other insignificant modifications that are not considered concessions, and loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act.

Year ended December 31,	2021	2020	2019
Number of loans approved for a trial modification	6,246	5,522	5,872
Number of loans permanently modified	4,588	6,850	4,918
Concession granted:^(a)			
Interest rate reduction	74 %	50 %	77 %
Term or payment extension	53	49	71
Principal and/or interest deferred	23	14	13
Principal forgiveness	2	2	5
Other ^(b)	36	66	63

(a) Represents concessions granted in permanent modifications as a percentage of the number of loans permanently modified. The sum of the percentages exceeds 100% because predominantly all of the modifications include more than one type of concession. Concessions offered on trial modifications are generally consistent with those granted on permanent modifications.

(b) Includes variable interest rate to fixed interest rate modifications and payment delays that meet the definition of a TDR.

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Financial effects of modifications and redefaults

The following table provides information about the financial effects of the various concessions granted in modifications of residential real estate loans under the loss mitigation programs described above and about redefaults of certain loans modified in TDRs for the periods presented. The following table presents only the financial effects of permanent modifications and do not include temporary concessions offered through trial modifications. This table also excludes Chapter 7 loans where the sole concession granted is the discharge of debt, loans with short-term or other insignificant modifications that are not considered concessions, and loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act.

Year ended December 31, (in millions, except weighted - average data)	2021	2020	2019
Weighted-average interest rate of loans with interest rate reductions - before TDR	4.54 %	5.09 %	5.68 %
Weighted-average interest rate of loans with interest rate reductions - after TDR	2.92	3.28	3.81
Weighted-average remaining contractual term (in years) of loans with term or payment extensions - before TDR	23	22	20
Weighted-average remaining contractual term (in years) of loans with term or payment extensions - after TDR	38	39	39
Charge-offs recognized upon permanent modification	\$ -	\$ 5	\$ 1
Principal deferred	28	16	19
Principal forgiven	1	5	7
Balance of loans that redefaulted within one year of permanent modification ^(a)	\$ 160	\$ 199	\$ 166

(a) Represents loans permanently modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The dollar amounts presented represent the balance of such loans at the end of the reporting period in which such loans defaulted. For residential real estate loans modified in TDRs, payment default is deemed to occur when the loan becomes two contractual payments past due. In the event that a modified loan redefaults, it will generally be liquidated through foreclosure or another similar type of liquidation transaction. Defaults of loans modified within the last twelve months may not be representative of ultimate redefault levels.

At December 31, 2021, the weighted-average estimated remaining lives of residential real estate loans permanently modified in TDRs were 4 years. The estimated remaining lives of these loans reflect estimated prepayments, both voluntary and involuntary (i.e., foreclosures and other forced liquidations).

Active and suspended foreclosure

At December 31, 2021 and 2020, the Firm had residential real estate loans, excluding those insured by U.S. government agencies, with a carrying value of \$619 million and \$846 million, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Auto and other

The following tables provide information on delinquency, which is the primary credit quality indicator for retained auto and other consumer loans.

(in millions, except ratios)	December 31, 2021								
	Term loans by origination year						Revolving loans		Total
	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	
Loan delinquency^(a)									
Current	\$ 35,323	\$ 18,324	\$ 7,443	\$ 3,671	\$ 1,800	\$ 666	\$ 2,242	\$ 120	\$ 69,589
30-119 days past due	192	720	88	53	31	21	12	6	1,123
120 or more days past due	–	35	–	–	1	1	5	7	49
Total retained loans	\$ 35,515	\$ 19,079	\$ 7,531	\$ 3,724	\$ 1,832	\$ 688	\$ 2,259	\$ 133	\$ 70,761
% of 30+ days past due to total retained loans ^(b)	0.54 %	0.47 %	1.17 %	1.42 %	1.75 %	3.20 %	0.75 %	9.77 %	1.66 %

(in millions, except ratios)	December 31, 2020								
	Term loans by origination year						Revolving loans		Total
	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	
Loan delinquency^(a)									
Current	\$ 46,169	\$ 12,829	\$ 7,367	\$ 4,521	\$ 2,058	\$ 742	\$ 2,517	\$ 158	\$ 76,361
30-119 days past due	97	107	77	53	42	23	30	17	446
120 or more days past due	–	–	–	1	–	1	8	8	18
Total retained loans	\$ 46,266	\$ 12,936	\$ 7,444	\$ 4,575	\$ 2,100	\$ 766	\$ 2,555	\$ 183	\$ 76,825
% of 30+ days past due to total retained loans	0.21 %	0.83 %	1.03 %	1.18 %	2.00 %	3.13 %	1.49 %	13.66 %	0.60 %

- (a) At December 31, 2021 and 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
- (b) At December 31, 2021, auto and other loans excluded \$667 million of PPP loans guaranteed by the SBA that are 30 or more days past due. These amounts have been excluded based upon the SBA guarantee. At December 31, 2020, all PPP loans guaranteed by the SBA were current.
- (c) At December 31, 2021, included \$4.4 billion of loans originated in 2021 and \$1.0 billion of loans originated in 2020 in Business Banking under the PPP. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.
- (d) At December 31, 2020, included \$19.2 billion of loans in Business Banking under the PPP.

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Nonaccrual and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained auto and other consumer loans.

(in millions, except ratios)	Total Auto and other	
	December 31, 2021	December 31, 2020
Nonaccrual loans ^{(a)(b)(c)}	119	151
Geographic region ^(d)		
California	\$ 11,163	\$ 12,302
Texas	7,859	8,235
New York	5,848	8,824
Florida	4,901	4,668
Illinois	2,930	3,768
New Jersey	2,355	2,646
Pennsylvania	2,004	1,924
Arizona	1,887	2,465
Ohio	1,843	2,163
Louisiana	1,801	1,808
All other	28,170	28,022
Total retained loans	\$ 70,761	\$ 76,825

- (a) At December 31, 2021, nonaccrual loans excluded \$506 million of PPP loans 90 or more days past due and guaranteed by the SBA, of which \$35 million is no longer accruing interest based on the guidelines set by the SBA. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting the guidelines set by the SBA. There were no loans that were not guaranteed by the SBA that are 90 or more days past due and still accruing interest at December 31, 2021 and 2020.
- (b) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to the charge down, the related allowance may be negative.
- (c) Interest income on nonaccrual loans recognized on a cash basis was not material for the years ended December 31, 2021 and 2020.
- (d) The geographic regions presented in this table are ordered based on the magnitude of the corresponding loan balances at December 31, 2021.

Loan modifications

Certain auto and other loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs.

The impact of these modifications, as well as new TDRs, were not material to the Firm for the years ended December 31, 2021, 2020 and 2019. Additional commitments to lend to borrowers whose loans have been modified in TDRs as of December 31, 2021 and 2020 were not material.

Credit card loan portfolio

The credit card portfolio segment includes credit card loans originated and purchased by the Firm. Delinquency rates are the primary credit quality indicator for credit card loans as they provide an early warning that borrowers may be experiencing difficulties (30 days past due); information on those borrowers that have been delinquent for a longer period of time (90 days past due) is also considered. In addition to delinquency rates, the geographic distribution of the loans provides insight as to the credit quality of the portfolio based on the regional economy.

While the borrower's credit score is another general indicator of credit quality, the Firm does not view credit scores as a primary indicator of credit quality because the borrower's credit score tends to be a lagging indicator. The

distribution of such scores provides a general indicator of credit quality trends within the portfolio; however, the score does not capture all factors that would be predictive of future credit performance. Refreshed FICO score information, which is obtained at least quarterly, for a statistically significant random sample of the credit card portfolio is indicated in the following table. FICO is considered to be the industry benchmark for credit scores.

The Firm generally originates new card accounts to prime consumer borrowers. However, certain cardholders' FICO scores may decrease over time, depending on the performance of the cardholder and changes in the credit score calculation.

The following tables provide information on delinquency, which is the primary credit quality indicator for retained credit card loans.

(in millions, except ratios)	December 31, 2021		
	Within the revolving period	Converted to term loans ^(b)	Total
Loan delinquency^(a)			
Current and less than 30 days past due and still accruing	\$ 151,798	\$ 901	\$ 152,699
30-89 days past due and still accruing	770	59	829
90 or more days past due and still accruing	741	27	768
Total retained loans	\$ 153,309	\$ 987	\$ 154,296
Loan delinquency ratios			
% of 30+ days past due to total retained loans	0.99 %	8.71 %	1.04 %
% of 90+ days past due to total retained loans	0.48	2.74	0.50
December 31, 2020			
(in millions, except ratios)	Within the revolving period	Converted to term loans ^(b)	Total
Loan delinquency^(a)			
Current and less than 30 days past due and still accruing	\$ 139,783	\$ 1,239	\$ 141,022
30-89 days past due and still accruing	997	94	1,091
90 or more days past due and still accruing	1,277	42	1,319
Total retained loans	\$ 142,057	\$ 1,375	\$ 143,432
Loan delinquency ratios			
% of 30+ days past due to total retained loans	1.60 %	9.89 %	1.68 %
% of 90+ days past due to total retained loans	0.90	3.05	0.92

(a) At December 31, 2021 and 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.

(b) Represents TDRs.

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Other credit quality indicators

The following table provides information on other credit quality indicators for retained credit card loans.

(in millions, except ratios)	December 31, 2021		December 31, 2020	
Geographic region^(a)				
California	\$	23,030	\$	20,921
Texas		15,879		14,544
New York		12,652		11,919
Florida		10,412		9,562
Illinois		8,530		8,006
New Jersey		6,367		5,927
Ohio		4,923		4,673
Pennsylvania		4,708		4,476
Colorado		4,573		4,092
Michigan		3,773		3,553
All other		59,449		55,759
Total retained loans	\$	154,296	\$	143,432
Percentage of portfolio based on carrying value with estimated refreshed FICO scores				
Equal to or greater than 660		88.5 %		85.9 %
Less than 660		11.3		13.9
No FICO available		0.2		0.2

(a) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2021.

Loan modifications

The Firm may offer loan modification programs granting concessions to credit card borrowers who are experiencing financial difficulty. The Firm grants concessions for most of the credit card loans under long-term programs. These modifications involve placing the customer on a fixed payment plan, generally for 60 months, and typically include reducing the interest rate on the credit card. Substantially all modifications under the Firm's long-term programs are considered to be TDRs. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs.

If the cardholder does not comply with the modified payment terms, then the credit card loan continues to age and will ultimately be charged-off in accordance with the Firm's standard charge-off policy. In most cases, the Firm does not reinstate the borrower's line of credit.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the concessions granted on credit card loans modified in TDRs and redefaults for the periods presented. For all periods disclosed, new enrollments were less than 1% of total retained credit card loans.

Year ended December 31, (in millions, except weighted-average data)	2021	2020	2019
Balance of new TDRs ^(a)	\$ 393	\$ 818	\$ 961
Weighted-average interest rate of loans - before TDR	17.75 %	18.04 %	19.07 %
Weighted-average interest rate of loans - after TDR	5.14	4.64	4.70
Balance of loans that redefaulted within one year of modification ^(b)	\$ 57	\$ 110	\$ 148

(a) Represents the outstanding balance prior to modification.

(b) Represents loans modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The amounts presented represent the balance of such loans as of the end of the quarter in which they defaulted.

For credit card loans modified in TDRs, payment default is deemed to have occurred when the borrower misses two consecutive contractual payments. Defaulted modified credit card loans remain in the modification program and continue to be charged off in accordance with the Firm's standard charge-off policy.

Wholesale loan portfolio

Wholesale loans include loans made to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals.

The primary credit quality indicator for wholesale loans is the internal risk rating assigned to each loan. Risk ratings are used to identify the credit quality of loans and differentiate risk within the portfolio. Risk ratings on loans consider the PD and the LGD. The PD is the likelihood that a loan will default. The LGD is the estimated loss on the loan that would be realized upon the default of the borrower and takes into consideration collateral and structural support for each credit facility.

Management considers several factors to determine an appropriate internal risk rating, including the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. The Firm's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's, however the quantitative characteristics (e.g., PD and LGD) may differ as they reflect internal historical experiences and assumptions. The Firm generally considers internal ratings with qualitative characteristics equivalent to BBB-/Baa3 or higher as investment grade, and these ratings have a lower PD and/or lower LGD than non-investment grade ratings.

Noninvestment-grade ratings are further classified as noncriticized and criticized, and the criticized portion is further subdivided into performing and nonaccrual loans, representing management's assessment of the collectibility of principal and interest. Criticized loans have a higher PD than noncriticized loans. The Firm's definition of criticized aligns with the U.S. banking regulatory definition of criticized exposures, which consist of special mention, substandard and doubtful categories.

Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information affecting the obligor's ability to fulfill its obligations.

As noted above, the risk rating of a loan considers the industry in which the obligor conducts its operations. As part of the overall credit risk management framework, the Firm focuses on the management and diversification of its industry and client exposures, with particular attention paid to industries with actual or potential credit concern. Refer to Note 4 for further detail on industry concentrations.

Notes to consolidated financial statements

The following tables provide information on internal risk rating, which is the primary credit quality indicator for retained wholesale loans.

December 31, (in millions, except ratios)	Secured by real estate		Commercial and industrial		Other ^(b)		Total retained loans	
	2021	2020	2021	2020	2021	2020	2021	2020
Loans by risk ratings								
Investment-grade	\$ 92,369	\$ 90,147	\$ 75,783	\$ 71,917	\$ 241,859	\$ 217,209	\$ 410,011	\$ 379,273
Noninvestment-grade:								
Noncriticized	22,495	26,129	62,039	57,870	52,440	33,053	136,974	117,052
Criticized performing	3,645	3,234	6,900	10,991	770	1,079	11,315	15,304
Criticized nonaccrual ^(a)	326	483	969	1,931	759	904	2,054	3,318
Total noninvestment-grade	26,466	29,846	69,908	70,792	53,969	35,036	150,343	135,674
Total retained loans	\$ 118,835	\$ 119,993	\$ 145,691	\$ 142,709	\$ 295,828	\$ 252,245	\$ 560,354	\$ 514,947
% of investment-grade to total retained loans	77.73 %	75.13 %	52.02 %	50.39 %	81.76 %	86.11 %	73.17 %	73.65 %
% of total criticized to total retained loans	3.34	3.10	5.40	9.05	0.52	0.79	2.39	3.62
% of criticized nonaccrual to total retained loans	0.27	0.40	0.67	1.35	0.26	0.36	0.37	0.64

(a) At December 31, 2021, nonaccrual loans excluded \$127 million of PPP loans 90 or more days past due and guaranteed by the SBA, predominantly in commercial and industrial.

(b) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly Global Private Bank clients within AWM). Refer to Note 14 for more information on SPEs.

Secured by real estate									
December 31, 2021									
(in millions)	Term loans by origination year						Revolving loans		Total
	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	
Loans by risk ratings									
Investment-grade	\$ 23,346	\$ 16,030	\$ 17,265	\$ 8,103	\$ 7,325	\$ 19,066	\$ 1,226	\$ 8	\$ 92,369
Noninvestment-grade	5,364	3,826	4,564	3,806	2,834	5,613	458	1	26,466
Total retained loans	\$ 28,710	\$ 19,856	\$ 21,829	\$ 11,909	\$ 10,159	\$ 24,679	\$ 1,684	\$ 9	\$ 118,835

Secured by real estate									
December 31, 2020									
(in millions)	Term loans by origination year ^(a)						Revolving loans		Total
	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	
Loans by risk ratings									
Investment-grade	\$ 17,004	\$ 19,870	\$ 12,448	\$ 11,218	\$ 13,611	\$ 14,898	\$ 1,098	\$ –	\$ 90,147
Noninvestment-grade	4,998	6,027	5,886	4,184	3,738	4,523	489	1	29,846
Total retained loans	\$ 22,002	\$ 25,897	\$ 18,334	\$ 15,402	\$ 17,349	\$ 19,421	\$ 1,587	\$ 1	\$ 119,993

(a) Prior-period amounts have been revised to conform with the current presentation.

Commercial and industrial									
December 31, 2021									
(in millions)	Term loans by origination year						Revolving loans		Total
	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	
Loans by risk ratings									
Investment-grade	\$ 21,342	\$ 6,268	\$ 3,609	\$ 1,269	\$ 1,108	\$ 819	\$ 41,367	\$ 1	\$ 75,783 ^(a)
Noninvestment-grade	19,314	7,112	4,559	2,177	930	430	35,312	74	69,908
Total retained loans	\$ 40,656	\$ 13,380	\$ 8,168	\$ 3,446	\$ 2,038	\$ 1,249	\$ 76,679	\$ 75	\$ 145,691

Commercial and industrial									
December 31, 2020									
(in millions)	Term loans by origination year ^(b)						Revolving loans		Total
	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	
Loans by risk ratings									
Investment-grade	\$ 21,233	\$ 7,341	\$ 2,950	\$ 1,756	\$ 1,034	\$ 1,178	\$ 36,424	\$ 1	\$ 71,917 ^(c)
Noninvestment-grade	15,488	9,189	5,470	2,323	611	786	36,852	73	70,792
Total retained loans	\$ 36,721	\$ 16,530	\$ 8,420	\$ 4,079	\$ 1,645	\$ 1,964	\$ 73,276	\$ 74	\$ 142,709

(a) At December 31, 2021, \$1.1 billion of the \$1.3 billion total PPP loans in the wholesale portfolio were commercial and industrial. Of the \$1.1 billion, \$698 million were originated in 2021 and \$396 million were originated in 2020. PPP loans are guaranteed by the SBA and considered investment-grade. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

(b) Prior-period amounts have been revised to conform with the current presentation.

(c) At December 31, 2020, \$7.4 billion of the \$8.0 billion total PPP loans in the wholesale portfolio were commercial and industrial.

Other ^(a)									
December 31, 2021									
(in millions)	Term loans by origination year						Revolving loans		Total
	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	
Loans by risk ratings									
Investment-grade	\$ 26,782	\$ 17,829	\$ 6,125	\$ 2,885	\$ 3,868	\$ 7,651	\$ 176,118	\$ 601	\$ 241,859
Noninvestment-grade	16,905	2,399	1,455	935	218	467	31,585	5	53,969
Total retained loans	\$ 43,687	\$ 20,228	\$ 7,580	\$ 3,820	\$ 4,086	\$ 8,118	\$ 207,703	\$ 606	\$ 295,828

Other ^(a)									
December 31, 2020									
(in millions)	Term loans by origination year ^(b)						Revolving loans		Total
	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	
Loans by risk ratings									
Investment-grade	\$ 33,190	\$ 11,116	\$ 7,455	\$ 6,804	\$ 4,089	\$ 8,252	\$ 145,524	\$ 779	\$ 217,209
Noninvestment-grade	5,048	2,231	1,660	553	175	535	24,710	124	35,036
Total retained loans	\$ 38,238	\$ 13,347	\$ 9,115	\$ 7,357	\$ 4,264	\$ 8,787	\$ 170,234	\$ 903	\$ 252,245

(a) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly Global Private Bank clients within AWM). Refer to Note 14 for more information on SPEs.

(b) Prior-period amounts have been revised to conform with the current presentation.

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The following table presents additional information on retained loans secured by real estate within the Wholesale portfolio, which consists of loans secured wholly or substantially by a lien or liens on real property at origination. Multifamily lending includes financing for acquisition, leasing and construction of apartment buildings. Other commercial lending largely includes financing for acquisition, leasing and construction, largely for office, retail and industrial real estate. Included in secured by real estate loans is \$5.7 billion and \$6.4 billion as of December 31, 2021 and 2020, respectively, of construction and development loans made to finance land development and on-site construction of commercial, industrial, residential, or farm buildings.

December 31, (in millions, except ratios)	Multifamily		Other Commercial		Total retained loans secured by real estate	
	2021	2020	2021	2020	2021	2020
Retained loans secured by real estate	\$ 73,801	\$ 73,078	\$ 45,034	\$ 46,915	\$ 118,835	\$ 119,993
Criticized	1,671	1,144	2,300	2,573	3,971	3,717
% of total criticized to total retained loans secured by real estate	2.26 %	1.57 %	5.11 %	5.48 %	3.34 %	3.10 %
Criticized nonaccrual	\$ 91	\$ 56	\$ 235	\$ 427	\$ 326	\$ 483
% of criticized nonaccrual loans to total retained loans secured by real estate	0.12 %	0.08 %	0.52 %	0.91 %	0.27 %	0.40 %

Geographic distribution and delinquency

The following table provides information on the geographic distribution and delinquency for retained wholesale loans.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2021	2020	2021	2020	2021	2020	2021	2020
Loans by geographic distribution^(a)								
Total U.S.	\$ 115,732	\$ 116,990	\$ 106,449	\$ 109,273	\$ 215,750	\$ 180,583	\$ 437,931	\$ 406,846
Total non-U.S.	3,103	3,003	39,242	33,436	80,078	71,662	122,423	108,101
Total retained loans	\$ 118,835	\$ 119,993	\$ 145,691	\$ 142,709	\$ 295,828	\$ 252,245	\$ 560,354	\$ 514,947
Loan delinquency^(b)								
Current and less than 30 days past due and still accruing	\$ 118,163	\$ 118,894	\$ 143,459	\$ 140,100	\$ 293,358	\$ 249,713	\$ 554,980	\$ 508,707
30-89 days past due and still accruing	331	601	1,193	658	1,590	1,606	3,114	2,865
90 or more days past due and still accruing ^(c)	15	15	70	20	121	22	206	57
Criticized nonaccrual ^(d)	326	483	969	1,931	759	904	2,054	3,318
Total retained loans	\$ 118,835	\$ 119,993	\$ 145,691	\$ 142,709	\$ 295,828	\$ 252,245	\$ 560,354	\$ 514,947

(a) The U.S. and non-U.S. distribution is determined based predominantly on the domicile of the borrower.

(b) At December 31, 2021 and December 31, 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent. The credit quality of wholesale loans is assessed primarily through ongoing review and monitoring of an obligor's ability to meet contractual obligations rather than relying on the past due status, which is generally a lagging indicator of credit quality.

(c) Represents loans that are considered well-collateralized and therefore still accruing interest.

(d) At December 31, 2021, nonaccrual loans excluded \$127 million of PPP loans 90 or more days past due and guaranteed by the SBA, predominantly in commercial and industrial.

Nonaccrual loans

The following table provides information on retained wholesale nonaccrual loans.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2021	2020	2021	2020	2021	2020	2021	2020
Nonaccrual loans^(a)								
With an allowance	\$ 254	\$ 351	\$ 604	\$ 1,667	\$ 286	\$ 800	\$ 1,144	\$ 2,818
Without an allowance ^(b)	72	132	365	264	473	104	910	500
Total nonaccrual loans^(c)	\$ 326	\$ 483	\$ 969	\$ 1,931	\$ 759	\$ 904	\$ 2,054	\$ 3,318

(a) Loans that were modified in response to the COVID-19 pandemic continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2021, substantially all of these loans were considered performing.

(b) When the discounted cash flows or collateral value equals or exceeds the amortized cost of the loan, the loan does not require an allowance. This typically occurs when the loans have been partially charged off and/or there have been interest payments received and applied to the loan balance.

(c) Interest income on nonaccrual loans recognized on a cash basis were not material for the years ended December 31, 2021 and 2020.

Loan modifications

Certain loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs nor are loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act. New TDRs during the years ended December 31, 2021, 2020 and 2019 were \$881 million, \$734 million and \$407 million, respectively. New TDRs during the years ended December 31, 2021, 2020 and 2019 reflected deferral of principal and interest payments, extending maturity dates and the receipt of assets in partial satisfaction of the loan predominantly in Other and Commercial and Industrial loan classes. The impact of these modifications resulting in new TDRs was not material to the Firm for the years ended December 31, 2021, 2020 and 2019. The carrying value of TDRs was \$607 million and \$954 million as of December 31, 2021 and 2020, respectively.

Note 13 – Allowance for credit losses

The Firm's allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The allowance for credit losses comprises:

- the allowance for loan losses, which covers the Firm's retained loan portfolios (scored and risk-rated) and is presented separately on the Consolidated balance sheets,
- the allowance for lending-related commitments, which is presented on the Consolidated balance sheets in accounts payable and other liabilities, and
- the allowance for credit losses on investment securities, which is recognized within investment securities on the Consolidated balance sheets.

The income statement effect of all changes in the allowance for credit losses is recognized in the provision for credit losses.

Determining the appropriateness of the allowance for credit losses is complex and requires significant judgment by management about the effect of matters that are inherently uncertain. At least quarterly, the allowance for credit losses is reviewed by the CRO, the CFO and the Controller of the Firm. Subsequent evaluations of credit exposures, considering the macroeconomic conditions, forecasts and other factors then prevailing, may result in significant changes in the allowance for credit losses in future periods. The Firm's policies used to determine its allowance for loan losses and its allowance for lending-related commitments are described in the following paragraphs. Refer to Note 10 for a description of the policies used to determine the allowance for credit losses on investment securities.

Methodology for allowances for loan losses and lending-related commitments

The allowance for loan losses and allowance for lending-related commitments represents expected credit losses over the remaining expected life of retained loans and lending-related commitments that are not unconditionally cancellable. The Firm does not record an allowance for future draws on unconditionally cancellable lending-related commitments (e.g., credit cards). Expected losses related to accrued interest on credit card loans and certain performing, modified loans to borrowers impacted by COVID-19 are considered in the Firm's allowance for loan losses. However, the Firm does not record an allowance on other accrued interest receivables, due to its policy to write these receivables off no later than 90 days past due by reversing interest income.

The expected life of each instrument is determined by considering its contractual term, expected prepayments, cancellation features, and certain extension and call options. The expected life of funded credit card loans is generally estimated by considering expected future payments on the credit card account, and determining how much of those amounts should be allocated to repayments

of the funded loan balance (as of the balance sheet date) versus other account activity. This allocation is made using an approach that incorporates the payment application requirements of the Credit Card Accountability Responsibility and Disclosure Act of 2009, generally paying down the highest interest rate balances first.

The estimate of expected credit losses includes expected recoveries of amounts previously charged off or expected to be charged off, even if such recoveries result in a negative allowance.

Collective and Individual Assessments

When calculating the allowance for loan losses and the allowance for lending-related commitments, the Firm assesses whether exposures share similar risk characteristics. If similar risk characteristics exist, the Firm estimates expected credit losses collectively, considering the risk associated with a particular pool and the probability that the exposures within the pool will deteriorate or default. The assessment of risk characteristics is subject to significant management judgment. Emphasizing one characteristic over another or considering additional characteristics could affect the allowance.

- Relevant risk characteristics for the consumer portfolio include product type, delinquency status, current FICO scores, geographic distribution, and, for collateralized loans, current LTV ratios.
- Relevant risk characteristics for the wholesale portfolio include LOB, geography, risk rating, delinquency status, level and type of collateral, industry, credit enhancement, product type, facility purpose, tenor, and payment terms.

The majority of the Firm's credit exposures share risk characteristics with other similar exposures, and as a result are collectively assessed for impairment ("portfolio-based component"). The portfolio-based component covers consumer loans, performing risk-rated loans and certain lending-related commitments.

If an exposure does not share risk characteristics with other exposures, the Firm generally estimates expected credit losses on an individual basis, considering expected repayment and conditions impacting that individual exposure ("asset-specific component"). The asset-specific component covers modified PCD loans, loans modified or reasonably expected to be modified in a TDR, collateral-dependent loans, as well as, risk-rated loans that have been placed on nonaccrual status.

Portfolio-based component

The portfolio-based component begins with a quantitative calculation that considers the likelihood of the borrower changing delinquency status or moving from one risk rating to another. The quantitative calculation covers expected credit losses over an instrument's expected life and is estimated by applying credit loss factors to the Firm's estimated exposure at default. The credit loss factors incorporate the probability of borrower default as well as loss severity in the event of default. They are derived using

a weighted average of five internally developed macroeconomic scenarios over an eight-quarter forecast period, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the eight-quarter forecast period. The five macroeconomic scenarios consist of a central, relative adverse, extreme adverse, relative upside and extreme upside scenario, and are updated by the Firm's central forecasting team. The scenarios take into consideration the Firm's macroeconomic outlook, internal perspectives from subject matter experts across the Firm, and market consensus and involve a governed process that incorporates feedback from senior management across LOBs, Corporate Finance and Risk Management.

The quantitative calculation is adjusted to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet reflected in the calculation. These adjustments are accomplished in part by analyzing the historical loss experience, including during stressed periods, for each major product or model. Management applies judgment in making this adjustment, including taking into account uncertainties associated with the economic and political conditions, quality of underwriting standards, borrower behavior, credit concentrations or deterioration within an industry, product or portfolio, as well as other relevant internal and external factors affecting the credit quality of the portfolio. In certain instances, the interrelationships between these factors create further uncertainties.

The application of different inputs into the quantitative calculation, and the assumptions used by management to adjust the quantitative calculation, are subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for loan losses and the allowance for lending-related commitments.

Asset-specific component

To determine the asset-specific component of the allowance, collateral-dependent loans (including those loans for which foreclosure is probable) and larger, nonaccrual risk-rated loans in the wholesale portfolio segment are generally evaluated individually, while smaller loans (both scored and risk-rated) are aggregated for evaluation using factors relevant for the respective class of assets.

The Firm generally measures the asset-specific allowance as the difference between the amortized cost of the loan and the present value of the cash flows expected to be collected, discounted at the loan's original effective interest rate. Subsequent changes in impairment are generally recognized as an adjustment to the allowance for loan losses. For collateral-dependent loans, the fair value of collateral less estimated costs to sell is used to determine the charge-off amount for declines in value (to reduce the amortized cost of the loan to the fair value of collateral) or the amount of negative allowance that should be

recognized (for recoveries of prior charge-offs associated with improvements in the fair value of collateral).

The asset-specific component of the allowance for loans that have been or are expected to be modified in TDRs incorporates the effect of the modification on the loan's expected cash flows (including forgone interest, principal forgiveness, as well as other concessions), and also the potential for redefault. For residential real estate loans modified in or expected to be modified in TDRs, the Firm develops product-specific probability of default estimates, which are applied at a loan level to compute expected losses. In developing these probabilities of default, the Firm considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about housing prices and unemployment, based upon industry-wide data. The Firm also considers its own historical loss experience to-date based on actual redefaulted modified loans. For credit card loans modified in or expected to be modified in TDRs, expected losses incorporate projected delinquencies and charge-offs based on the Firm's historical experience by type of modification program. For wholesale loans modified or expected to be modified in TDRs, expected losses incorporate management's expectation of the borrower's ability to repay under the modified terms.

Estimating the timing and amounts of future cash flows is highly judgmental as these cash flow projections rely upon estimates such as loss severities, asset valuations, default rates (including redefault rates on modified loans), the amounts and timing of interest or principal payments (including any expected prepayments) or other factors that are reflective of current and expected market conditions. These estimates are, in turn, dependent on factors such as the duration of current overall economic conditions, industry, portfolio, or borrower-specific factors, the expected outcome of insolvency proceedings as well as, in certain circumstances, other economic factors. All of these estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

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Allowance for credit losses and related information

The table below summarizes information about the allowances for credit losses, and includes a breakdown of loans and lending-related commitments by impairment methodology. Refer to Note 10 for further information on the allowance for credit losses on investment securities.

(Table continued on next page)

Year ended December 31, (in millions)	2021			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Allowance for loan losses				
Beginning balance at January 1,	\$ 3,636	\$ 17,800	\$ 6,892	\$ 28,328
Cumulative effect of a change in accounting principle ^(a)	NA	NA	NA	NA
Gross charge-offs	630	3,651	283	4,564
Gross recoveries collected	(619)	(939)	(141)	(1,699)
Net charge-offs	11	2,712	142	2,865
Write-offs of PCI loans ^(b)	NA	NA	NA	NA
Provision for loan losses	(1,858)	(4,838)	(2,375)	(9,071)
Other	(2)	–	(4)	(6)
Ending balance at December 31,	\$ 1,765	\$ 10,250	\$ 4,371	\$ 16,386
Allowance for lending-related commitments				
Beginning balance at January 1,	\$ 187	\$ –	\$ 2,222	\$ 2,409
Cumulative effect of a change in accounting principle ^(a)	NA	NA	NA	NA
Provision for lending-related commitments	(75)	–	(74)	(149)
Other	1	–	–	1
Ending balance at December 31,	\$ 113	\$ –	\$ 2,148	\$ 2,261
Total allowance for investment securities	NA	NA	NA	\$ 42
Total allowance for credit losses	\$ 1,878	\$ 10,250	\$ 6,519	\$ 18,689
Allowance for loan losses by impairment methodology				
Asset-specific ^(c)	\$ (665)	\$ 313	\$ 263	\$ (89)
Portfolio-based	2,430	9,937	4,108	16,475
PCI	NA	NA	NA	NA
Total allowance for loan losses	\$ 1,765	\$ 10,250	\$ 4,371	\$ 16,386
Loans by impairment methodology				
Asset-specific ^(c)	\$ 13,919	\$ 987	\$ 2,255	\$ 17,161
Portfolio-based	281,637	153,309	558,099	993,045
PCI	NA	NA	NA	NA
Total retained loans	\$ 295,556	\$ 154,296	\$ 560,354	\$ 1,010,206
Collateral-dependent loans				
Net charge-offs	\$ 33	\$ –	\$ 38	\$ 71
Loans measured at fair value of collateral less cost to sell	4,472	–	617	5,089
Allowance for lending-related commitments by impairment methodology				
Asset-specific	\$ –	\$ –	\$ 167	\$ 167
Portfolio-based	113	–	1,981	2,094
Total allowance for lending-related commitments^(d)	\$ 113	\$ –	\$ 2,148	\$ 2,261
Lending-related commitments by impairment methodology				
Asset-specific	\$ –	\$ –	\$ 764	\$ 764
Portfolio-based ^(e)	29,588	–	453,571	483,159
Total lending-related commitments	\$ 29,588	\$ –	\$ 454,335	\$ 483,923

(a) Represents the impact to allowance for credit losses upon the adoption of CECL on January 1, 2020. Refer to Note 1 for further information.

(b) Prior to the adoption of CECL, write-offs of PCI loans were recorded against the allowance for loan losses when actual losses for a pool exceeded estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan was recognized when the underlying loan was removed from a pool.

(c) Includes collateral dependent loans, including those considered TDRs and those for which foreclosure is deemed probable, modified PCDD loans and non-collateral dependent loans that have been modified or are reasonably expected to be modified in a TDR. Also includes risk-rated loans that have been

placed on nonaccrual status for the wholesale portfolio segment. The asset-specific credit card allowance for loans modified, or reasonably expected to be modified, in a TDR is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.

(d) The allowance for lending-related commitments is reported in accounts payable and other liabilities on the Consolidated balance sheets.

(e) At December 31, 2021, 2020 and 2019, lending-related commitments excluded \$15.7 billion, \$19.5 billion and \$9.8 billion, respectively, for the consumer, excluding credit card portfolio segment; \$730.5 billion, \$658.5 billion and \$650.7 billion, respectively, for the credit card portfolio segment; and \$32.1 billion, \$25.3 billion and \$24.1 billion, respectively, for the wholesale portfolio segment, which were not subject to the allowance for lending-related commitments. Prior-period amount for wholesale lending-related commitments, including the amount not subject to allowance, has been revised to conform with the current presentation.

(table continued from previous page)

2020				2019			
Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
\$ 2,538	\$ 5,683	\$ 4,902	\$ 13,123	\$ 3,434	\$ 5,184	\$ 4,827	\$ 13,445
297	5,517	(1,642)	4,172	NA	NA	NA	NA
805	5,077	954	6,836	902	5,436	472	6,810
(631)	(791)	(155)	(1,577)	(536)	(588)	(57)	(1,181)
174	4,286	799	5,259	366	4,848	415	5,629
NA	NA	NA	NA	151	—	—	151
974	10,886	4,431	16,291	(378)	5,348	479	5,449
1	—	—	1	(1)	(1)	11	9
\$ 3,636	\$ 17,800	\$ 6,892	\$ 28,328	\$ 2,538	\$ 5,683	\$ 4,902	\$ 13,123
\$ 12	\$ —	\$ 1,179	\$ 1,191	\$ 12	\$ —	\$ 1,043	\$ 1,055
133	—	(35)	98	NA	NA	NA	NA
42	—	1,079	1,121	—	—	136	136
—	—	(1)	(1)	—	—	—	—
\$ 187	\$ —	\$ 2,222	\$ 2,409	\$ 12	\$ —	\$ 1,179	\$ 1,191
NA	NA	NA	\$ 78	NA	NA	NA	NA
\$ 3,823	\$ 17,800	\$ 9,114	\$ 30,815	\$ 2,550	\$ 5,683	\$ 6,081	\$ 14,314
\$ (7)	\$ 633	\$ 682	\$ 1,308	\$ 75	\$ 477	\$ 295	\$ 847
3,643	17,167	6,210	27,020	1,476	5,206	4,607	11,289
NA	NA	NA	NA	987	—	—	987
\$ 3,636	\$ 17,800	\$ 6,892	\$ 28,328	\$ 2,538	\$ 5,683	\$ 4,902	\$ 13,123
\$ 16,648	\$ 1,375	\$ 3,606	\$ 21,629	\$ 5,961	\$ 1,452	\$ 1,123	\$ 8,536
285,479	142,057	511,341	938,877	268,675	167,472	480,555	916,702
NA	NA	NA	NA	20,363	—	—	20,363
\$ 302,127	\$ 143,432	\$ 514,947	\$ 960,506	\$ 294,999	\$ 168,924	\$ 481,678	\$ 945,601
\$ 133	\$ —	\$ 76	\$ 209	\$ 46	\$ —	\$ 36	\$ 82
4,956	—	188	5,144	2,053	—	87	2,140
\$ —	\$ —	\$ 114	\$ 114	\$ —	\$ —	\$ 102	\$ 102
187	—	2,108	2,295	12	—	1,077	1,089
\$ 187	\$ —	\$ 2,222	\$ 2,409	\$ 12	\$ —	\$ 1,179	\$ 1,191
\$ —	\$ —	\$ 577	\$ 577	\$ —	\$ —	\$ 474	\$ 474
37,783	—	423,993	461,776	30,417	—	392,967	423,384
\$ 37,783	\$ —	\$ 424,570	\$ 462,353	\$ 30,417	\$ —	\$ 393,441	\$ 423,858

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Discussion of changes in the allowance

The allowance for credit losses as of December 31, 2021 was \$18.7 billion, a decrease from \$30.8 billion at December 31, 2020. The decrease in the allowance for credit losses was primarily driven by improvements in the macroeconomic environment, consisting of:

- a \$9.5 billion reduction in consumer, predominantly in the credit card portfolio; and
- a \$2.6 billion net reduction in wholesale, across the LOBs.

The Firm's allowance for credit losses is estimated using a weighted average of five internally developed macroeconomic scenarios. As of December 31, 2021, the Firm assigned more balanced weightings to both its adverse and upside scenarios compared to the significant weighting that the Firm placed on its adverse scenarios as of December 31, 2020, reflecting the sustained improvement and resilience of the macroeconomic environment, despite the ongoing impact of the COVID-19 pandemic. In addition, because the impact of the COVID-19 pandemic and governmental actions taken in response to the pandemic caused a dislocation in certain historical relationships used for modeling credit loss estimates, the Firm continues to place reliance on management judgment and make adjustments specific to that dislocation, although to a lesser extent than in 2020. The allowance for credit losses of \$18.7 billion reflects remaining uncertainties, including the potential impact that additional waves or variants of COVID-19 may have on the pace of economic growth and near-term supply chain disruptions.

The Firm's central case assumptions reflected U.S. unemployment rates and year over year growth in U.S. real GDP as follows:

	Assumptions at December 31, 2021		
	2Q22	4Q22	2Q23
U.S. unemployment rate ^(a)	4.2 %	4.0 %	3.9 %
YoY growth in U.S. real GDP ^(b)	3.1 %	2.8 %	2.1 %

	Assumptions at December 31, 2020		
	2Q21	4Q21	2Q22
U.S. unemployment rate ^(a)	6.8 %	5.7 %	5.1 %
YoY growth in U.S. real GDP ^(b)	9.2 %	3.5 %	3.9 %

(a) Reflects quarterly average of forecasted U.S. unemployment rate.

(b) As of December 31, 2021, the year over year growth in U.S. real GDP in the forecast horizon of the central scenario is calculated as the percent change in U.S. real GDP levels from the prior year. This year over year growth rate replaces the previously disclosed pandemic-focused measure of the cumulative change in U.S. real GDP from pre-pandemic conditions at December 31, 2019. Prior periods have been revised to conform with the current presentation.

Subsequent changes to this forecast and related estimates will be reflected in the provision for credit losses in future periods.

Refer to Critical Accounting Estimates Used by the Firm on pages 150-153 for further information on the allowance for credit losses and related management judgments.

Refer to Consumer Credit Portfolio on pages 110-116, Wholesale Credit Portfolio on pages 117-128 for additional information on the consumer and wholesale credit portfolios.

Note 14 – Variable interest entities

Refer to Note 1 on page 165 for a further description of JPMorgan Chase’s accounting policies regarding consolidation of VIEs.

The following table summarizes the most significant types of Firm-sponsored VIEs by business segment. The Firm considers a “Firm-sponsored” VIE to include any entity where: (1) JPMorgan Chase is the primary beneficiary of the structure; (2) the VIE is used by JPMorgan Chase to securitize Firm assets; (3) the VIE issues financial instruments with the JPMorgan Chase name; or (4) the entity is a JPMorgan Chase-administered asset-backed commercial paper conduit.

Line of Business	Transaction Type	Activity	2021 Form 10-K page references
CCB	Credit card securitization trusts	Securitization of originated credit card receivables	253-254
	Mortgage securitization trusts	Servicing and securitization of both originated and purchased residential mortgages	254-256
CIB	Mortgage and other securitization trusts	Securitization of both originated and purchased residential and commercial mortgages, and other consumer loans	254-256
	Multi-seller conduits	Assisting clients in accessing the financial markets in a cost-efficient manner and structuring transactions to meet investor needs	256
	Municipal bond vehicles	Financing of municipal bond investments	256-257

The Firm’s other business segments are also involved with VIEs (both third-party and Firm-sponsored), but to a lesser extent, as follows:

- **Asset & Wealth Management:** AWM sponsors and manages certain funds that are deemed VIEs. As asset manager of the funds, AWM earns a fee based on assets managed; the fee varies with each fund’s investment objective and is competitively priced. For fund entities that qualify as VIEs, AWM’s interests are, in certain cases, considered to be significant variable interests that result in consolidation of the financial results of these entities.
- **Commercial Banking:** CB provides financing and lending-related services to a wide spectrum of clients, including certain third-party-sponsored entities that may meet the definition of a VIE. CB does not control the activities of these entities and does not consolidate these entities. CB’s maximum loss exposure, regardless of whether the entity is a VIE, is generally limited to loans and lending-related commitments which are reported and disclosed in the same manner as any other third-party transaction.
- **Corporate:** Corporate is involved with entities that may meet the definition of VIEs; however these entities are generally subject to specialized investment company accounting, which does not require the consolidation of investments, including VIEs. In addition, Treasury and CIO invest in securities generally issued by third parties which may meet the definition of VIEs (e.g., issuers of asset-backed securities). In general, the Firm does not have the power to direct the significant activities of these entities and therefore does not consolidate these entities. Refer to Note 10 for further information on the Firm’s investment securities portfolio.

In addition, CIB also invests in and provides financing and other services to VIEs sponsored by third parties. Refer to pages 257-258 of this Note for more information on consolidated VIE assets and liabilities as well as the VIEs sponsored by third parties.

Significant Firm-sponsored variable interest entities

Credit card securitizations

CCB’s Card business may securitize originated credit card loans, primarily through the Chase Issuance Trust (the “Trust”). The Firm’s continuing involvement in credit card securitizations includes servicing the receivables, retaining an undivided seller’s interest in the receivables, retaining certain senior and subordinated securities and maintaining escrow accounts.

The Firm consolidates the assets and liabilities of its sponsored credit card trusts as it is considered to be the primary beneficiary of these securitization trusts based on the Firm’s ability to direct the activities of these VIEs through its servicing responsibilities and other duties, including making decisions as to the receivables that are transferred into those trusts and as to any related modifications and workouts. Additionally, the nature and

extent of the Firm’s other continuing involvement with the trusts, as indicated above, obligates the Firm to absorb losses and gives the Firm the right to receive certain benefits from these VIEs that could potentially be significant.

The underlying securitized credit card receivables and other assets of the securitization trusts are available only for payment of the beneficial interests issued by the securitization trusts; they are not available to pay the Firm’s other obligations or the claims of the Firm’s creditors.

The agreements with the credit card securitization trusts require the Firm to maintain a minimum undivided interest in the credit card trusts (generally 5%). As of December 31, 2021 and 2020, the Firm held undivided interests in Firm-sponsored credit card securitization trusts of \$7.1 billion and \$5.4 billion, respectively. The Firm

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maintained an average undivided interest in principal receivables owned by those trusts of approximately 57% and 39% for the years ended December 31, 2021 and 2020, respectively. The Firm did not retain any senior securities and retained \$1.5 billion of subordinated securities in certain of its credit card securitization trusts at both December 31, 2021 and 2020. The Firm's undivided interests in the credit card trusts and securities retained are eliminated in consolidation.

Firm-sponsored mortgage and other securitization trusts

The Firm securitizes (or has securitized) originated and purchased residential mortgages, commercial mortgages and other consumer loans primarily in its CCB and CIB businesses. Depending on the particular transaction, as well as the respective business involved, the Firm may act as the servicer of the loans and/or retain certain beneficial interests in the securitization trusts.

The following tables present the total unpaid principal amount of assets held in Firm-sponsored private-label securitization entities, including those in which the Firm has continuing involvement, and those that are consolidated by the Firm. Continuing involvement includes servicing the loans, holding senior interests or subordinated interests (including amounts required to be held pursuant to credit risk retention rules), recourse or guarantee arrangements, and derivative contracts. In certain instances, the Firm's only continuing involvement is servicing the loans. The Firm's maximum loss exposure from retained and purchased interests is the carrying value of these interests.

December 31, 2021 (in millions)	Principal amount outstanding			JPMorgan Chase interest in securitized assets in nonconsolidated VIEs ^{(c)(d)(e)}			
	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by JPMorgan Chase
Securitization-related^(a)							
Residential mortgage:							
Prime/Alt-A and option ARMs	\$ 55,085	\$ 942	\$ 47,029	\$ 974	\$ 684	\$ 95	\$ 1,753
Subprime	10,966	27	10,115	2	—	—	2
Commercial and other ^(b)	150,694	—	93,698	671	3,274	506	4,451
Total	\$ 216,745	\$ 969	\$ 150,842	\$ 1,647	\$ 3,958	\$ 601	\$ 6,206

December 31, 2020 (in millions)	Principal amount outstanding			JPMorgan Chase interest in securitized assets in nonconsolidated VIEs ^{(c)(d)(e)}			
	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by JPMorgan Chase
Securitization-related^(a)							
Residential mortgage:							
Prime/Alt-A and option ARMs	\$ 49,644	\$ 1,693	\$ 41,265	\$ 574	\$ 724	\$ —	\$ 1,298
Subprime	12,896	46	12,154	9	—	—	9
Commercial and other ^(b)	119,732	—	92,351	955	1,549	262	2,766
Total	\$ 182,272	\$ 1,739	\$ 145,770	\$ 1,538	\$ 2,273	\$ 262	\$ 4,073

(a) Excludes U.S. GSEs and government agency securitizations and re-securitizations, which are not Firm-sponsored.

(b) Consists of securities backed by commercial real estate loans and non-mortgage-related consumer receivables purchased from third parties.

(c) Excludes the following: retained servicing; securities retained from loan sales and securitization activity related to U.S. GSEs and government agencies; interest rate and foreign exchange derivatives primarily used to manage interest rate and foreign exchange risks of securitization entities; senior and subordinated securities of \$145 million and \$36 million, respectively, at December 31, 2021, and \$105 million and \$40 million, respectively, at December 31, 2020, which the Firm purchased in connection with CIB's secondary market-making activities.

(d) Includes interests held in re-securitization transactions.

(e) As of December 31, 2021 and 2020, 79% and 73%, respectively, of the Firm's retained securitization interests, which are predominantly carried at fair value and include amounts required to be held pursuant to credit risk retention rules, were risk-rated "A" or better, on an S&P-equivalent basis. The retained interests in prime residential mortgages consisted of \$1.6 billion and \$1.3 billion of investment-grade retained interests, and \$131 million and \$41 million of noninvestment-grade retained interests at December 31, 2021 and 2020, respectively. The retained interests in commercial and other securitization trusts consisted of \$3.5 billion and \$2.0 billion of investment-grade retained interests, and \$929 million and \$753 million of noninvestment-grade retained interests at December 31, 2021 and 2020, respectively.

Residential mortgage

The Firm securitizes residential mortgage loans originated by CCB, as well as residential mortgage loans purchased from third parties by either CCB or CIB. CCB generally retains servicing for all residential mortgage loans it originated or purchased, and for certain mortgage loans purchased by CIB. For securitizations of loans serviced by CCB, the Firm has the power to direct the significant activities of the VIE because it is responsible for decisions related to loan modifications and workouts. CCB may also retain an interest upon securitization.

In addition, CIB engages in underwriting and trading activities involving securities issued by Firm-sponsored securitization trusts. As a result, CIB at times retains senior and/or subordinated interests (including residual interests and amounts required to be held pursuant to credit risk retention rules) in residential mortgage securitizations at the time of securitization, and/or reacquires positions in the secondary market in the normal course of business. In certain instances, as a result of the positions retained or reacquired by CIB or held by Treasury and CIO or CCB, when considered together with the servicing arrangements entered into by CCB, the Firm is deemed to be the primary beneficiary of certain securitization trusts.

The Firm does not consolidate residential mortgage securitizations (Firm-sponsored or third-party-sponsored) when it is not the servicer (and therefore does not have the power to direct the most significant activities of the trust) or does not hold a beneficial interest in the trust that could potentially be significant to the trust.

Commercial mortgages and other consumer securitizations
CIB originates and securitizes commercial mortgage loans, and engages in underwriting and trading activities involving the securities issued by securitization trusts. CIB may retain unsold senior and/or subordinated interests (including amounts required to be held pursuant to credit risk retention rules) in commercial mortgage securitizations at the time of securitization but, generally, the Firm does not service commercial loan securitizations. Treasury and CIO may choose to invest in these securitizations as well. For commercial mortgage securitizations the power to direct the significant activities of the VIE generally is held by the servicer or investors in a specified class of securities (“controlling class”). The Firm generally does not retain an interest in the controlling class in its sponsored commercial mortgage securitization transactions.

Re-securitizations

The Firm engages in certain re-securitization transactions in which debt securities are transferred to a VIE in exchange for new beneficial interests. These transfers occur in connection with both U.S. GSEs and government agency sponsored VIEs, which are backed by residential mortgages. The Firm’s consolidation analysis is largely dependent on the Firm’s role and interest in the re-securitization trusts.

The following table presents the principal amount of securities transferred to re-securitization VIEs.

Year ended December 31, (in millions)	2021	2020	2019
Transfers of securities to VIEs			
U.S. GSEs and government agencies	\$ 53,923	\$ 46,123	\$ 25,852

Most re-securitizations with which the Firm is involved are client-driven transactions in which a specific client or group of clients is seeking a specific return or risk profile. For these transactions, the Firm has concluded that the decision-making power of the entity is shared between the Firm and its clients, considering the joint effort and decisions in establishing the re-securitization trust and its assets, as well as the significant economic interest the client holds in the re-securitization trust; therefore the Firm does not consolidate the re-securitization VIE.

The Firm did not transfer any private label securities to re-securitization VIEs during 2021, 2020 and 2019, respectively, and retained interests in any such Firm-sponsored VIEs as of December 31, 2021 and 2020 were immaterial.

Additionally, the Firm may invest in beneficial interests of third-party-sponsored re-securitizations and generally purchases these interests in the secondary market. In these circumstances, the Firm does not have the unilateral ability to direct the most significant activities of the re-securitization trust, either because it was not involved in the initial design of the trust, or the Firm was involved with an independent third-party sponsor and demonstrated shared power over the creation of the trust; therefore, the Firm does not consolidate the re-securitization VIE.

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The following table presents information on the Firm's interests in nonconsolidated re-securitization VIEs.

December 31, (in millions)	Nonconsolidated re-securitization VIEs	
	2021	2020
U.S. GSEs and government agencies		
Interest in VIEs	\$ 1,947	\$ 2,631

As of December 31, 2021 and 2020, the Firm did not consolidate any U.S. GSE and government agency re-securitization VIEs or any Firm-sponsored private-label re-securitization VIEs.

Multi-seller conduits

Multi-seller conduit entities are separate bankruptcy remote entities that provide secured financing, collateralized by pools of receivables and other financial assets, to customers of the Firm. The conduits fund their financing facilities through the issuance of highly rated commercial paper. The primary source of repayment of the commercial paper is the cash flows from the pools of assets. In most instances, the assets are structured with deal-specific credit enhancements provided to the conduits by the customers (i.e., sellers) or other third parties. Deal-specific credit enhancements are generally structured to cover a multiple of historical losses expected on the pool of assets, and are typically in the form of overcollateralization provided by the seller. The deal-specific credit enhancements mitigate the Firm's potential losses on its agreements with the conduits.

To ensure timely repayment of the commercial paper, and to provide the conduits with funding to provide financing to customers in the event that the conduits do not obtain funding in the commercial paper market, each asset pool financed by the conduits has a minimum 100% deal-specific liquidity facility associated with it provided by JPMorgan Chase Bank, N.A. JPMorgan Chase Bank, N.A. also provides the multi-seller conduit vehicles with uncommitted program-wide liquidity facilities and program-wide credit enhancement in the form of standby letters of credit. The amount of program-wide credit enhancement required is based upon commercial paper issuance and approximates 10% of the outstanding balance of commercial paper.

The Firm consolidates its Firm-administered multi-seller conduits, as the Firm has both the power to direct the significant activities of the conduits and a potentially significant economic interest in the conduits. As administrative agent and in its role in structuring transactions, the Firm makes decisions regarding asset types and credit quality, and manages the commercial paper funding needs of the conduits. The Firm's interests that could potentially be significant to the VIEs include the fees received as administrative agent and liquidity and program-wide credit enhancement provider, as well as the potential exposure created by the liquidity and credit enhancement facilities provided to the conduits.

In the normal course of business, JPMorgan Chase makes markets in and invests in commercial paper issued by the Firm-administered multi-seller conduits. The Firm held \$13.7 billion and \$13.5 billion of the commercial paper issued by the Firm-administered multi-seller conduits at December 31, 2021 and 2020, respectively, which have been eliminated in consolidation. The Firm's investments reflect the Firm's funding needs and capacity and were not driven by market illiquidity. Other than the amounts required to be held pursuant to credit risk retention rules, the Firm is not obligated under any agreement to purchase the commercial paper issued by the Firm-administered multi-seller conduits.

Deal-specific liquidity facilities, program-wide liquidity and credit enhancement provided by the Firm have been eliminated in consolidation. The Firm or the Firm-administered multi-seller conduits provide lending-related commitments to certain clients of the Firm-administered multi-seller conduits. The unfunded commitments were \$13.4 billion and \$12.2 billion at December 31, 2021 and 2020, respectively, and are reported as off-balance sheet lending-related commitments in other unfunded commitments to extend credit. Refer to Note 28 for more information on off-balance sheet lending-related commitments.

Municipal bond vehicles

Municipal bond vehicles or tender option bond ("TOB") trusts allow institutions to finance their municipal bond investments at short-term rates. In a typical TOB transaction, the trust purchases highly rated municipal bond(s) of a single issuer and funds the purchase by issuing two types of securities: (1) puttable floating-rate certificates ("floaters") and (2) inverse floating-rate residual interests ("residuals"). The floaters are typically purchased by money market funds or other short-term investors and may be tendered, with requisite notice, to the TOB trust. The residuals are retained by the investor seeking to finance its municipal bond investment. TOB transactions where the residual is held by a third-party investor are typically known as customer TOB trusts, and non-customer TOB trusts are transactions where the Residual is retained by the Firm. Customer TOB trusts are sponsored by a third party. The Firm serves as sponsor for all non-customer TOB transactions. The Firm may provide various services to a TOB trust, including remarketing agent, liquidity or tender option provider, and/or sponsor.

J.P. Morgan Securities LLC may serve as a remarketing agent on the floaters for TOB trusts. The remarketing agent is responsible for establishing the periodic variable rate on the floaters, conducting the initial placement and remarketing tendered floaters. The remarketing agent may, but is not obligated to, make markets in floaters. Floaters held by the Firm were not material during 2021 and 2020.

JPMorgan Chase Bank, N.A. or J.P. Morgan Securities LLC often serves as the sole liquidity or tender option provider for the TOB trusts. The liquidity provider's obligation to

perform is conditional and is limited by certain events (“Termination Events”), which include bankruptcy or failure to pay by the municipal bond issuer or credit enhancement provider, an event of taxability on the municipal bonds or the immediate downgrade of the municipal bond to below investment grade. In addition, the liquidity provider’s exposure is typically further limited by the high credit quality of the underlying municipal bonds, the excess collateralization in the vehicle, or, in certain transactions, the reimbursement agreements with the Residual holders.

Holders of the floaters may “put,” or tender, their floaters to the TOB trust. If the remarketing agent cannot successfully remarket the floaters to another investor, the liquidity provider either provides a loan to the TOB trust for the TOB trust’s purchase of the floaters, or it directly purchases the tendered floaters.

TOB trusts are considered to be variable interest entities. The Firm consolidates non-customer TOB trusts because as the Residual holder, the Firm has the right to make decisions that significantly impact the economic performance of the municipal bond vehicle, and it has the right to receive benefits and bear losses that could potentially be significant to the municipal bond vehicle.

Consolidated VIE assets and liabilities

The following table presents information on assets and liabilities related to VIEs consolidated by the Firm as of December 31, 2021 and 2020.

December 31, 2021 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other ^(c)	Total assets ^(d)	Beneficial interests in VIE assets ^(e)	Other ^(f)	Total liabilities
VIE program type							
Firm-sponsored credit card trusts	\$ –	\$ 11,108	\$ 102	\$ 11,210	\$ 2,397	\$ 1	\$ 2,398
Firm-administered multi-seller conduits	1	19,883	71	19,955	6,198	41	6,239
Municipal bond vehicles	2,009	–	2	2,011	1,976	–	1,976
Mortgage securitization entities ^(a)	–	955	32	987	179	85	264
Other	–	1,078 ^(b)	283	1,361	–	118	118
Total	\$ 2,010	\$ 33,024	\$ 490	\$ 35,524	\$ 10,750	\$ 245	\$ 10,995

December 31, 2020 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other ^(c)	Total assets ^(d)	Beneficial interests in VIE assets ^(e)	Other ^(f)	Total liabilities
VIE program type							
Firm-sponsored credit card trusts	\$ –	\$ 11,962	\$ 148	\$ 12,110	\$ 4,943	\$ 3	\$ 4,946
Firm-administered multi-seller conduits	2	23,787	188	23,977	10,523	33	10,556
Municipal bond vehicles	1,930	–	2	1,932	1,902	–	1,902
Mortgage securitization entities ^(a)	–	1,694	94	1,788	210	108	318
Other	2	176	249	427	–	89	89
Total	\$ 1,934	\$ 37,619	\$ 681	\$ 40,234	\$ 17,578	\$ 233	\$ 17,811

(a) Includes residential and commercial mortgage securitizations.

(b) Largely includes purchased supply chain finance receivables and purchased auto loan securitizations in CIB.

(c) Includes assets classified as cash and other assets on the Consolidated balance sheets.

(d) The assets of the consolidated VIEs included in the program types above are used to settle the liabilities of those entities. The assets and liabilities include third-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation.

(e) The interest-bearing beneficial interest liabilities issued by consolidated VIEs are classified in the line item on the Consolidated balance sheets titled, “Beneficial interests issued by consolidated variable interest entities.” The holders of these beneficial interests generally do not have recourse to the general credit of JPMorgan Chase. Included in beneficial interests in VIE assets are long-term beneficial interests of \$2.6 billion and \$5.2 billion at December 31, 2021 and 2020, respectively.

(f) Includes liabilities classified as accounts payable and other liabilities on the Consolidated balance sheets.

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VIEs sponsored by third parties

The Firm enters into transactions with VIEs structured by other parties. These include, for example, acting as a derivative counterparty, liquidity provider, investor, underwriter, placement agent, remarketing agent, trustee or custodian. These transactions are conducted at arm's-length, and individual credit decisions are based on the analysis of the specific VIE, taking into consideration the quality of the underlying assets. Where the Firm does not have the power to direct the activities of the VIE that most significantly impact the VIE's economic performance, or a variable interest that could potentially be significant, the Firm generally does not consolidate the VIE, but it records and reports these positions on its Consolidated balance sheets in the same manner it would record and report positions in respect of any other third-party transaction.

Tax credit vehicles

The Firm holds investments in unconsolidated tax credit vehicles, which are limited partnerships and similar entities that own and operate affordable housing, energy, and other projects. These entities are primarily considered VIEs. A third party is typically the general partner or managing member and has control over the significant activities of the tax credit vehicles, and accordingly the Firm does not consolidate tax credit vehicles. The Firm generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits allocated to the projects. The maximum loss exposure, represented by equity investments and funding commitments, was \$26.8 billion and \$23.6 billion, of which \$9.4 billion and \$8.7 billion was unfunded at December 31, 2021 and 2020, respectively. The prior-period maximum loss exposure amount has been revised to conform with the current presentation. The Firm assesses each project and to reduce the risk of loss, may withhold varying amounts of its capital investment until the project qualifies for tax credits. Refer to Note 25 for further information on affordable housing tax credits. Refer to Note 28 for more information on off-balance sheet lending-related commitments.

Customer municipal bond vehicles (TOB trusts)

The Firm may provide various services to customer TOB trusts, including remarketing agent, liquidity or tender option provider. In certain customer TOB transactions, the Firm, as liquidity provider, has entered into a reimbursement agreement with the Residual holder. In those transactions, upon the termination of the vehicle, the Firm has recourse to the third-party Residual holders for any shortfall. The Firm does not have any intent to protect Residual holders from potential losses on any of the underlying municipal bonds. The Firm does not consolidate customer TOB trusts, since the Firm does not have the power to make decisions that significantly impact the economic performance of the municipal bond vehicle. The Firm's maximum exposure as a liquidity provider to customer TOB trusts at December 31, 2021 and 2020, was \$6.8 billion and \$6.7 billion, respectively. The fair value of assets held by such VIEs at both December 31, 2021 and 2020 was \$10.5 billion.

Loan securitizations

The Firm has securitized and sold a variety of loans, including residential mortgages, credit card receivables, and commercial mortgages. The purposes of these securitization transactions were to satisfy investor demand and to generate liquidity for the Firm.

For loan securitizations in which the Firm is not required to consolidate the trust, the Firm records the transfer of the loan receivable to the trust as a sale when all of the following accounting criteria for a sale are met: (1) the transferred financial assets are legally isolated from the Firm's creditors; (2) the transferee or beneficial interest holder can pledge or exchange the transferred financial assets; and (3) the Firm does not maintain effective control over the transferred financial assets (e.g., the Firm cannot repurchase the transferred assets before their maturity and it does not have the ability to unilaterally cause the holder to return the transferred assets).

For loan securitizations accounted for as a sale, the Firm recognizes a gain or loss based on the difference between the value of proceeds received (including cash, beneficial interests, or servicing assets received) and the carrying value of the assets sold. Gains and losses on securitizations are reported in noninterest revenue.

Securitization activity

The following table provides information related to the Firm's securitization activities for the years ended December 31, 2021, 2020 and 2019, related to assets held in Firm-sponsored securitization entities that were not consolidated by the Firm, and where sale accounting was achieved at the time of the securitization.

Year ended December 31, (in millions)	2021		2020		2019	
	Residential mortgage ^(d)	Commercial and other ^(e)	Residential mortgage ^(d)	Commercial and other ^(e)	Residential mortgage ^(d)	Commercial and other ^(e)
Principal securitized	\$ 23,876	\$ 14,917	\$ 7,103	\$ 6,624	\$ 9,957	\$ 9,390
All cash flows during the period:^(a)						
Proceeds received from loan sales as financial instruments ^{(b),(c)}	\$ 24,450	\$ 15,044	\$ 7,321	\$ 6,865	\$ 10,238	\$ 9,544
Servicing fees collected	153	1	211	1	287	2
Cash flows received on interests	578	273	801	239	507	237

(a) Excludes re-securitization transactions.

(b) Predominantly includes Level 2 assets.

(c) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.

(d) Represents prime mortgages. Excludes loan securitization activity related to U.S. GSEs and government agencies.

(e) Includes commercial mortgage and other consumer loans.

Key assumptions used to value retained interests originated during the year are shown in the table below.

Year ended December 31,	2021	2020	2019
Residential mortgage retained interest:			
Weighted-average life (in years)	3.9	4.7	4.8
Weighted-average discount rate	3.3 %	8.2 %	7.4 %
Commercial mortgage retained interest:			
Weighted-average life (in years)	6.0	6.9	6.4
Weighted-average discount rate	1.2 %	3.0 %	4.1 %

Loans and excess MSR sold to U.S. government-sponsored enterprises and loans in securitization transactions pursuant to Ginnie Mae guidelines

In addition to the amounts reported in the securitization activity tables above, the Firm, in the normal course of business, sells originated and purchased mortgage loans and certain originated excess MSR on a nonrecourse basis, predominantly to U.S. GSEs. These loans and excess MSR are sold primarily for the purpose of securitization by the U.S. GSEs, who provide certain guarantee provisions (e.g., credit enhancement of the loans). The Firm also sells loans into securitization transactions pursuant to Ginnie Mae guidelines; these loans are typically insured or guaranteed by another U.S. government agency. The Firm does not consolidate the securitization vehicles underlying these transactions as it is not the primary beneficiary. For a limited number of loan sales, the Firm is obligated to share a portion of the credit risk associated with the sold loans with the purchaser. Refer to Note 28 for additional information about the Firm's loan sales- and securitization-related indemnifications. Refer to Note 15 for additional information on MSR.

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The following table summarizes the activities related to loans sold to the U.S. GSEs, and loans in securitization transactions pursuant to Ginnie Mae guidelines.

Year ended December 31, (in millions)	2021	2020	2019
Carrying value of loans sold	\$ 105,035	\$ 81,153	\$ 92,349
Proceeds received from loan sales as cash	\$ 161	\$ 45	\$ 73
Proceeds from loan sales as securities ^{(a)(b)}	103,286	80,186	91,422
Total proceeds received from loan sales^(c)	\$ 103,447	\$ 80,231	\$ 91,495
Gains/(losses) on loan sales ^{(d)(e)}	\$ 9	\$ 6	\$ 499

(a) Includes securities from U.S. GSEs and Ginnie Mae that are generally sold shortly after receipt or retained as part of the Firm's investment securities portfolio.

(b) Included in Level 2 assets.

(c) Excludes the value of MSRs retained upon the sale of loans.

(d) Gains/(losses) on loan sales include the value of MSRs.

(e) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.

Options to repurchase delinquent loans

In addition to the Firm's obligation to repurchase certain loans due to material breaches of representations and warranties as discussed in Note 28, the Firm also has the option to repurchase delinquent loans that it services for Ginnie Mae loan pools, as well as for other U.S. government agencies under certain arrangements. The Firm typically elects to repurchase delinquent loans from Ginnie Mae loan

pools as it continues to service them and/or manage the foreclosure process in accordance with the applicable requirements, and such loans continue to be insured or guaranteed. When the Firm's repurchase option becomes exercisable, such loans must be reported on the Consolidated balance sheets as a loan with a corresponding liability. Refer to Note 12 for additional information.

The following table presents loans the Firm repurchased or had an option to repurchase, real estate owned, and foreclosed government-guaranteed residential mortgage loans recognized on the Firm's Consolidated balance sheets as of December 31, 2021 and 2020. Substantially all of these loans and real estate are insured or guaranteed by U.S. government agencies.

December 31, (in millions)	2021	2020
Loans repurchased or option to repurchase ^(a)	\$ 1,022	\$ 1,413
Real estate owned	5	9
Foreclosed government-guaranteed residential mortgage loans ^(b)	36	64

(a) Predominantly all of these amounts relate to loans that have been repurchased from Ginnie Mae loan pools.

(b) Relates to voluntary repurchases of loans, which are included in accrued interest and accounts receivable.

Loan delinquencies and liquidation losses

The table below includes information about components of and delinquencies related to nonconsolidated securitized financial assets held in Firm-sponsored private-label securitization entities, in which the Firm has continuing involvement as of December 31, 2021 and 2020.

As of or for the year ended December 31, (in millions)	Securitized assets		90 days past due		Net liquidation losses	
	2021	2020	2021	2020	2021	2020
Securitized loans						
Residential mortgage:						
Prime/ Alt-A & option ARMs	\$ 47,029	\$ 41,265	\$ 2,466	\$ 4,988	\$ 17	\$ 212
Subprime	10,115	12,154	1,609	2,406	16	179
Commercial and other	93,698	92,351	1,456	5,958	288	30
Total loans securitized	\$ 150,842	\$ 145,770	\$ 5,531	\$ 13,352	\$ 321	\$ 421

Note 15 – Goodwill and Mortgage servicing rights

Goodwill

Goodwill is recorded upon completion of a business combination as the difference between the purchase price and the fair value of the net assets acquired, and can be adjusted up to one year from the acquisition date as more information is obtained about the fair value of assets acquired and liabilities assumed. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment during the fourth quarter of each fiscal year, or more often if events or circumstances, such as adverse changes in the business climate, indicate that there may be an impairment.

The goodwill associated with each business combination is allocated to the related reporting units, which are generally determined based on how the Firm's businesses are managed and how they are reviewed. The following table presents goodwill attributed to the reportable business segments and Corporate.

December 31, (in millions)	2021	2020	2019
Consumer & Community Banking	\$ 31,474	\$ 31,311	\$ 30,133
Corporate & Investment Bank	7,906	7,913	7,901
Commercial Banking	2,986	2,985	2,982
Asset & Wealth Management	7,222	7,039	6,807
Corporate ^(a)	727	–	–
Total goodwill	\$ 50,315	\$ 49,248	\$ 47,823

(a) For goodwill in Corporate acquired in the third quarter of 2021, the Firm elected to perform a qualitative impairment assessment, as permitted under U.S. GAAP.

The following table presents changes in the carrying amount of goodwill.

Year ended December 31, (in millions)	2021	2020	2019
Balance at beginning of period	\$ 49,248	\$ 47,823	\$ 47,471
Changes during the period from:			
Business combinations ^(a)	1,124	1,412	349
Other ^(b)	(57)	13	3
Balance at December 31,	\$ 50,315	\$ 49,248	\$ 47,823

(a) For 2021, represents estimated goodwill associated with the acquisitions of Nutmeg in Corporate, OpenInvest and Campbell Global in AWM, and Frank and The Infatuation in CCB. For 2020, represents estimated goodwill associated with the acquisitions of cxLoyalty in CCB and 55ip in AWM. For 2019, represents goodwill associated with the acquisition of InstaMed. This goodwill was allocated to CIB, CB and CCB.

(b) Primarily foreign currency adjustments and adjustments to goodwill related to prior period acquisitions.

Goodwill impairment testing

The Firm's goodwill was not impaired at December 31, 2021, 2020 and 2019.

Effective January 1, 2020, the Firm adopted new accounting guidance related to goodwill impairment testing. The adoption of the guidance requires recognition of an impairment loss when the estimated fair value of a reporting unit falls below its carrying value. It eliminated the requirement that an impairment loss be recognized only

if the estimated implied fair value of the goodwill is below its carrying value.

The goodwill impairment test is generally performed by comparing the current fair value of each reporting unit with its carrying value. If the fair value is in excess of the carrying value, then the reporting unit's goodwill is considered not to be impaired. If the fair value is less than the carrying value, then an impairment charge is recognized for the amount by which the reporting unit's carrying value exceeds its fair value, up to the amount of goodwill allocated to that reporting unit.

The Firm uses the reporting units' allocated capital plus goodwill and other intangible assets as a proxy for the carrying values of equity for the reporting units in the goodwill impairment testing. Reporting unit equity is determined on a similar basis as the allocation of capital to the LOBs which takes into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. Proposed LOB capital levels are incorporated into the Firm's annual budget process, which is reviewed by the Firm's Board of Directors. Allocated capital is further reviewed periodically and updated as needed.

The primary method the Firm uses to estimate the fair value of its reporting units is the income approach. This approach projects cash flows for the forecast period and uses the perpetuity growth method to calculate terminal values. These cash flows and terminal values are then discounted using an appropriate discount rate. Projections of cash flows are based on the reporting units' earnings forecasts which are reviewed with senior management of the Firm. The discount rate used for each reporting unit represents an estimate of the cost of equity for that reporting unit and is determined considering the Firm's overall estimated cost of equity (estimated using the Capital Asset Pricing Model), as adjusted for the risk characteristics specific to each reporting unit (for example, for higher levels of risk or uncertainty associated with the business or management's forecasts and assumptions). To assess the reasonableness of the discount rates used for each reporting unit, management compares the discount rate to the estimated cost of equity for publicly traded institutions with similar businesses and risk characteristics. In addition, the weighted average cost of equity (aggregating the various reporting units) is compared with the Firm's overall estimated cost of equity to ensure reasonableness. The valuations derived from the discounted cash flow analysis are then compared with market-based trading and transaction multiples for relevant competitors. Trading and transaction comparables are used as general indicators to assess the overall reasonableness of the estimated fair values, although precise conclusions generally cannot be drawn due to the differences that naturally exist between the Firm's businesses and competitor institutions.

Management also takes into consideration a comparison between the aggregate fair values of the Firm's reporting

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units and JPMorgan Chase's market capitalization. In evaluating this comparison, management considers several factors, including (i) a control premium that would exist in a market transaction, (ii) factors related to the level of execution risk that would exist at the Firmwide level that do not exist at the reporting unit level and (iii) short-term market volatility and other factors that do not directly affect the value of individual reporting units.

Unanticipated declines in business performance, increases in credit losses, increases in capital requirements, as well as deterioration in economic or market conditions, adverse regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair values of the Firm's reporting units to decline in the future, which could result in a material impairment charge to earnings in a future period related to some portion of the associated goodwill.

Mortgage servicing rights

MSRs represent the fair value of expected future cash flows for performing servicing activities for others. The fair value considers estimated future servicing fees and ancillary revenue, offset by estimated costs to service the loans, and generally declines over time as net servicing cash flows are received, effectively amortizing the MSR asset against contractual servicing and ancillary fee income. MSRs are either purchased from third parties or recognized upon sale or securitization of mortgage loans if servicing is retained.

As permitted by U.S. GAAP, the Firm has elected to account for its MSRs at fair value. The Firm treats its MSRs as a single class of servicing assets based on the availability of market inputs used to measure the fair value of its MSR asset and its treatment of MSRs as one aggregate pool for risk management purposes. The Firm estimates the fair value of MSRs using an option-adjusted spread ("OAS") model, which projects MSR cash flows over multiple interest rate scenarios in conjunction with the Firm's prepayment model, and then discounts these cash flows at risk-adjusted rates. The model considers portfolio characteristics, contractually specified servicing fees, prepayment assumptions, delinquency rates, costs to service, late charges and other ancillary revenue, and other economic factors. The Firm compares fair value estimates and assumptions to observable market data where available, and also considers recent market activity and actual portfolio experience.

The fair value of MSRs is sensitive to changes in interest rates, including their effect on prepayment speeds. MSRs typically decrease in value when interest rates decline because declining interest rates tend to increase prepayments and therefore reduce the expected life of the net servicing cash flows that comprise the MSR asset. Conversely, securities (e.g., mortgage-backed securities), and certain derivatives (e.g., those for which the Firm

receives fixed-rate interest payments) increase in value when interest rates decline. JPMorgan Chase uses combinations of derivatives and securities to manage the risk of changes in the fair value of MSRs. The intent is to offset any interest-rate related changes in the fair value of MSRs with changes in the fair value of the related risk management instruments.

The following table summarizes MSR activity for the years ended December 31, 2021, 2020 and 2019.

As of or for the year ended December 31, (in millions, except where otherwise noted)	2021	2020	2019
Fair value at beginning of period	\$ 3,276	\$ 4,699	\$ 6,130
MSR activity:			
Originations of MSRs	1,659	944	1,384
Purchase of MSRs	1,363	248	105
Disposition of MSRs ^(a)	(114)	(176)	(789)
Net additions/(dispositions)	2,908	1,016	700
Changes due to collection/realization of expected cash flows	(788)	(899)	(951)
Changes in valuation due to inputs and assumptions:			
Changes due to market interest rates and other ^(b)	404	(1,568)	(893)
Changes in valuation due to other inputs and assumptions:			
Projected cash flows (e.g., cost to service)	109	(54)	(333) ^(e)
Discount rates	–	199	153
Prepayment model changes and other ^(c)	(415)	(117)	(107)
Total changes in valuation due to other inputs and assumptions	(306)	28	(287)
Total changes in valuation due to inputs and assumptions	98	(1,540)	(1,180)
Fair value at December 31,	\$ 5,494	\$ 3,276	\$ 4,699
Change in unrealized gains/(losses) included in income related to MSRs held at December 31,	\$ 98	\$ (1,540)	\$ (1,180)
Contractual service fees, late fees and other ancillary fees included in income	1,298	1,325	1,639
Third-party mortgage loans serviced at December 31, (in billions)	520	448	522
Servicer advances, net of an allowance for uncollectible amounts, at December 31, (in billions) ^(d)	1.6	1.8	2.0

- (a) Includes excess MSRs transferred to agency-sponsored trusts in exchange for stripped mortgage backed securities (“SMBS”) for the years ended December 31, 2020 and 2019. In each transaction, a portion of the SMBS was acquired by third parties at the transaction date; the Firm acquired the remaining balance of those SMBS as trading securities.
- (b) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
- (c) Represents changes in prepayments other than those attributable to changes in market interest rates.
- (d) Represents amounts the Firm pays as the servicer (e.g., scheduled principal and interest, taxes and insurance), which will generally be reimbursed within a short period of time after the advance from future cash flows from the trust or the underlying loans. The Firm’s credit risk associated with these servicer advances is minimal because reimbursement of the advances is typically senior to all cash payments to investors. In addition, the Firm maintains the right to stop payment to investors if the collateral is insufficient to cover the advance. However, certain of these servicer advances may not be recoverable if they were not made in accordance with applicable rules and agreements.
- (e) The decrease in projected cash flows was largely related to default servicing assumption updates.

Notes to consolidated financial statements

The following table presents the components of mortgage fees and related income (including the impact of MSR risk management activities) for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions)	2021	2020	2019
CCB mortgage fees and related income			
Production revenue	\$ 2,215	\$ 2,629	\$ 1,618
Net mortgage servicing revenue:			
Operating revenue:			
Loan servicing revenue	1,257	1,367	1,533
Changes in MSR asset fair value due to collection/realization of expected cash flows	(788)	(899)	(951)
Total operating revenue	469	468	582
Risk management:			
Changes in MSR asset fair value due to market interest rates and other ^(a)	404	(1,568)	(893)
Other changes in MSR asset fair value due to other inputs and assumptions in model ^(b)	(306)	28	(287)
Change in derivative fair value and other	(623)	1,522	1,015
Total risk management	(525)	(18)	(165)
Total net mortgage servicing revenue	(56)	450	417
Total CCB mortgage fees and related income	2,159	3,079	2,035
All other	11	12	1
Mortgage fees and related income	\$ 2,170	\$ 3,091	\$ 2,036

- (a) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
- (b) Represents the aggregate impact of changes in model inputs and assumptions such as projected cash flows (e.g., cost to service), discount rates and changes in prepayments other than those attributable to changes in market interest rates (e.g., changes in prepayments due to changes in home prices).

The table below outlines the key economic assumptions used to determine the fair value of the Firm's MSRs at December 31, 2021 and 2020, and outlines the sensitivities of those fair values to immediate adverse changes in those assumptions, as defined below.

December 31, (in millions, except rates)	2021	2020
Weighted-average prepayment speed assumption (constant prepayment rate)	9.90 %	14.90 %
Impact on fair value of 10% adverse change	\$ (210)	\$ (206)
Impact on fair value of 20% adverse change	(404)	(392)
Weighted-average option adjusted spread ^(a)	6.44 %	7.19 %
Impact on fair value of 100 basis points adverse change	\$ (225)	\$ (134)
Impact on fair value of 200 basis points adverse change	(433)	(258)

(a) Includes the impact of operational risk and regulatory capital.

Changes in fair value based on variations in assumptions generally cannot be easily extrapolated, because the relationship of the change in the assumptions to the change in fair value are often highly interrelated and may not be linear. In this table, the effect that a change in a particular assumption may have on the fair value is calculated without changing any other assumption. In reality, changes in one factor may result in changes in another, which would either magnify or counteract the impact of the initial change.

Note 16 – Premises and equipment

Premises and equipment, including leasehold improvements, are carried at cost less accumulated depreciation and amortization. JPMorgan Chase computes depreciation using the straight-line method over the estimated useful life of an asset. For leasehold improvements, the Firm uses the straight-line method computed over the lesser of the remainder of the lease term, or estimated useful life of the improvements.

JPMorgan Chase capitalizes certain costs associated with the acquisition or development of internal-use software. Once the software is ready for its intended use, these costs are amortized on a straight-line basis over the software's expected useful life and reviewed for impairment on an ongoing basis.

Note 17 – Deposits

At December 31, 2021 and 2020, noninterest-bearing and interest-bearing deposits were as follows.

December 31, (in millions)	2021	2020
U.S. offices		
Noninterest-bearing (included \$8,115 and \$9,873 at fair value) ^(a)	\$ 638,879	\$ 572,711
Interest-bearing (included \$629 and \$2,567 at fair value) ^(a)	1,432,578	1,197,032
Total deposits in U.S. offices	2,071,457	1,769,743
Non-U.S. offices		
Noninterest-bearing (included \$2,420 and \$1,486 at fair value) ^(a)	26,229	23,435
Interest-bearing (included \$169 and \$558 at fair value) ^(a)	364,617	351,079
Total deposits in non-U.S. offices	390,846	374,514
Total deposits	\$ 2,462,303	\$ 2,144,257

(a) Includes structured notes classified as deposits for which the fair value option has been elected. Refer to Note 3 for further discussion.

At December 31, 2021 and 2020, time deposits in denominations that met or exceeded the insured limit were as follows.

December 31, (in millions)	2021	2020
U.S. offices	\$ 38,970	\$ 33,812
Non-U.S. offices ^(a)	54,535	50,776 ^(b)
Total	\$ 93,505	\$ 84,588

(a) Represents all time deposits in non-U.S. offices as these deposits typically exceed the insured limit.

(b) Prior-period amount has been revised to conform with the current presentation.

At December 31, 2021, the maturities of interest-bearing time deposits were as follows.

December 31, 2021 (in millions)	U.S.	Non-U.S.	Total
2022	\$ 47,595	\$ 50,805	\$ 98,400
2023	771	308	1,079
2024	269	10	279
2025	202	38	240
2026	169	821	990
After 5 years	484	132	616
Total	\$ 49,490	\$ 52,114	\$ 101,604

Note 18 - Leases**Firm as lessee**

At December 31, 2021, JPMorgan Chase and its subsidiaries were obligated under a number of noncancellable leases, predominantly operating leases for premises and equipment used primarily for business purposes. These leases generally have terms of 20 years or less, determined based on the contractual maturity of the lease, and include periods covered by options to extend or terminate the lease when the Firm is reasonably certain that it will exercise those options. All leases with lease terms greater than twelve months are reported as a lease liability with a corresponding right-of-use (“ROU”) asset. None of these lease agreements impose restrictions on the Firm’s ability to pay dividends, engage in debt or equity financing transactions or enter into further lease agreements. Certain of these leases contain escalation clauses that will increase rental payments based on maintenance, utility and tax increases, which are non-lease components. The Firm elected not to separate lease and non-lease components of a contract for its real estate leases. As such, real estate lease payments represent payments on both lease and non-lease components.

Operating lease liabilities and ROU assets are recognized at the lease commencement date based on the present value of the future minimum lease payments over the lease term. The future lease payments are discounted at a rate that represents the Firm’s collateralized borrowing rate for financing instruments of a similar term and are included in accounts payable and other liabilities. The operating lease ROU asset, included in premises and equipment, also includes any lease prepayments made, plus initial direct costs incurred, less any lease incentives received. Rental expense associated with operating leases is recognized on a straight-line basis over the lease term, and generally included in occupancy expense in the Consolidated statements of income.

The following tables provide information related to the Firm’s operating leases:

December 31, (in millions, except where otherwise noted)	2021	2020
Right-of-use assets	\$ 7,888	\$ 8,006
Lease liabilities	8,328	8,508
Weighted average remaining lease term (in years)	8.5	8.7
Weighted average discount rate	3.40 %	3.48 %

Supplemental cash flow information

Cash paid for amounts included in the measurement of lease liabilities - operating cash flows	\$ 1,656	\$ 1,626
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Supplemental non-cash information

Right-of-use assets obtained in exchange for operating lease obligations	\$ 1,167	\$ 1,350
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Year ended December 31, (in millions)	2021	2020
Rental expense		
Gross rental expense	\$ 2,086	\$ 2,094
Sublease rental income	(129)	(166)
Net rental expense	\$ 1,957	\$ 1,928

The following table presents future payments under operating leases as of December 31, 2021:

Year ended December 31, (in millions)	
2022	\$ 1,572
2023	1,435
2024	1,285
2025	1,115
2026	862
After 2026	3,453
Total future minimum lease payments	9,722
Less: Imputed interest	(1,394)
Total	\$ 8,328

In addition to the table above, as of December 31, 2021, the Firm had additional future operating lease commitments of \$0.9 billion that were signed but had not yet commenced. These operating leases will commence between 2022 and 2023 with lease terms up to 22 years.

Firm as lessor

The Firm provides auto and equipment lease financing to its customers through lease arrangements with lease terms that may contain renewal, termination and/or purchase options. The Firm's lease financings are predominantly auto operating leases. These assets subject to operating leases are recognized in other assets on the Firm's Consolidated balance sheets and are depreciated on a straight-line basis over the lease term to reduce the asset to its estimated residual value. Depreciation expense is included in technology, communications and equipment expense in the Consolidated statements of income. The Firm's lease income is generally recognized on a straight-line basis over the lease term and is included in other income in the Consolidated statements of income.

On a periodic basis, the Firm assesses leased assets for impairment, and if the carrying amount of the leased asset exceeds the undiscounted cash flows from the lease payments and the estimated residual value upon disposition of the leased asset, an impairment loss is recognized.

The risk of loss on auto and equipment leased assets relating to the residual value of the leased assets is monitored through projections of the asset residual values at lease origination and periodic review of residual values, and is mitigated through arrangements with certain manufacturers or lessees.

The following table presents the carrying value of assets subject to leases reported on the Consolidated balance sheets:

December 31, (in millions)	2021	2020
Carrying value of assets subject to operating leases, net of accumulated depreciation	\$ 17,553	\$ 21,155
Accumulated depreciation	5,737	6,388

The following table presents the Firm's operating lease income and the related depreciation expense on the Consolidated statements of income:

Year ended December 31, (in millions)	2021	2020	2019
Operating lease income	\$ 4,914	\$ 5,539	\$ 5,455
Depreciation expense	3,380	4,257	4,157

The following table presents future receipts under operating leases as of December 31, 2021:

Year ended December 31, (in millions)	
2022	\$ 2,984
2023	1,674
2024	559
2025	48
2026	43
After 2026	—
Total future minimum lease receipts	\$ 5,308

Notes to consolidated financial statements

Note 19 – Accounts payable and other liabilities

Accounts payable and other liabilities consist of brokerage payables, which include payables to customers and payables related to security purchases that did not settle, as well as other accrued expenses, such as credit card rewards liability, operating lease liabilities, income tax payables, and litigation reserves.

The following table details the components of accounts payable and other liabilities.

December 31, (in millions)	2021	2020
Brokerage payables	\$ 169,172	\$ 140,291
Other payables and liabilities ^{(a)(b)}	93,583	90,994
Total accounts payable and other liabilities	\$ 262,755	\$ 231,285

(a) Includes credit card rewards liability of \$9.8 billion and \$7.7 billion at December 31, 2021 and 2020, respectively.

(b) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Note 20 – Long-term debt

JPMorgan Chase issues long-term debt denominated in various currencies, predominantly U.S. dollars, with both fixed and variable interest rates. Included in senior and subordinated debt below are various equity-linked or other indexed instruments, which the Firm has elected to measure at fair value. Changes in fair value are recorded in principal transactions revenue in the Consolidated statements of income, except for unrealized gains/(losses) due to DVA which are recorded in OCI. The following table is a summary of long-term debt carrying values (including unamortized premiums and discounts, issuance costs, valuation adjustments and fair value adjustments, where applicable) by remaining contractual maturity as of December 31, 2021.

By remaining maturity at December 31, (in millions, except rates)	2021				2020		
	Under 1 year	1-5 years	After 5 years	Total	Total		
Parent company							
Senior debt:	Fixed rate	\$ 9,900	\$ 71,001	\$ 121,469	\$ 202,370	\$ 180,208	(h)
	Variable rate	845	9,106	3,392	13,343	11,877	(h)
	Interest rates ^(a)	2.93 %	2.22 %	3.00 %	2.67 %	2.97 %	
Subordinated debt:	Fixed rate	\$ –	\$ 8,168	\$ 10,101	\$ 18,269	\$ 19,255	
	Variable rate	–	–	–	–	9	
	Interest rates ^(a)	– %	4.21 %	4.28 %	4.24 %	4.24 %	
Subtotal		\$ 10,745	\$ 88,275	\$ 134,962	\$ 233,982	\$ 211,349	
Subsidiaries							
Federal Home Loan Banks advances:	Fixed rate	\$ 8	\$ 45	\$ 57	\$ 110	\$ 123	
	Variable rate	–	11,000	–	11,000	14,000	
	Interest rates ^(a)	5.53 %	0.19 %	6.14 %	0.23 %	0.34 %	
Senior debt:	Fixed rate	\$ 775	\$ 4,701	\$ 10,028	\$ 15,504	\$ 16,227	(h)
	Variable rate	11,248	19,896	7,003	38,147	37,642	(h)
	Interest rates ^(a)	4.55 %	4.92 %	1.64 %	2.09 %	2.28 %	
Subordinated debt:	Fixed rate	\$ –	\$ 287	\$ –	\$ 287	\$ 309	
	Variable rate	–	–	–	–	–	
	Interest rates ^(a)	– %	8.25 %	– %	8.25 %	8.25 %	
Subtotal		\$ 12,031	\$ 35,929	\$ 17,088	\$ 65,048	\$ 68,301	
Junior subordinated debt:	Fixed rate	\$ –	\$ –	\$ 678	\$ 678	\$ 738	
	Variable rate	–	–	1,297	1,297	1,297	
	Interest rates ^(a)	– %	– %	3.20 %	3.20 %	3.26 %	
Subtotal		\$ –	\$ –	\$ 1,975	\$ 1,975	\$ 2,035	
Total long-term debt^{(b)(c)(d)}		\$ 22,776	\$ 124,204	\$ 154,025	\$ 301,005	\$ 281,685	^{(f)(g)}
Long-term beneficial interests:							
Fixed rate	Fixed rate	\$ 748	\$ 999	\$ –	\$ 1,747	\$ 2,369	
	Variable rate	650	–	179	829	2,784	
	Interest rates ^(a)	1.39 %	1.53 %	3.24 %	1.57 %	1.30 %	
Total long-term beneficial interests^(e)		\$ 1,398	\$ 999	\$ 179	\$ 2,576	\$ 5,153	

- (a) The interest rates shown are the weighted average of contractual rates in effect at December 31, 2021 and 2020, respectively, including non-U.S. dollar fixed- and variable-rate issuances, which excludes the effects of the associated derivative instruments used in hedge accounting relationships, if applicable. The interest rates shown exclude structured notes accounted for at fair value.
- (b) Included long-term debt of \$14.1 billion and \$17.2 billion secured by assets totaling \$170.6 billion and \$166.4 billion at December 31, 2021 and 2020, respectively. The amount of long-term debt secured by assets does not include amounts related to hybrid instruments.
- (c) Included \$74.9 billion and \$76.8 billion of long-term debt accounted for at fair value at December 31, 2021 and 2020, respectively.
- (d) Included \$15.8 billion and \$16.1 billion of outstanding zero-coupon notes at December 31, 2021 and 2020, respectively. The aggregate principal amount of these notes at their respective maturities is \$46.4 billion and \$45.3 billion, respectively. The aggregate principal amount reflects the contractual principal payment at maturity, which may exceed the contractual principal payment at the Firm's next call date, if applicable.
- (e) Included on the Consolidated balance sheets in beneficial interests issued by consolidated VIEs. Also included \$12 million and \$41 million accounted for at fair value at December 31, 2021 and 2020, respectively. Excluded short-term commercial paper and other short-term beneficial interests of \$8.2 billion and \$12.4 billion at December 31, 2021 and 2020, respectively.
- (f) At December 31, 2021, long-term debt in the aggregate of \$185.0 billion was redeemable at the option of JPMorgan Chase, in whole or in part, prior to maturity, based on the terms specified in the respective instruments.
- (g) The aggregate carrying values of debt that matures in each of the five years subsequent to 2021 is \$22.8 billion in 2022, \$32.6 billion in 2023, \$36.4 billion in 2024, \$26.1 billion in 2025 and \$29.1 billion in 2026.
- (h) Prior-period amounts have been revised to conform with the current presentation.

Notes to consolidated financial statements

The weighted-average contractual interest rates for total long-term debt excluding structured notes accounted for at fair value were 2.67% and 2.89% as of December 31, 2021 and 2020, respectively. In order to modify exposure to interest rate and currency exchange rate movements, JPMorgan Chase utilizes derivative instruments, primarily interest rate and cross-currency interest rate swaps, in conjunction with some of its debt issuances. The use of these instruments modifies the Firm's interest expense on the associated debt. The modified weighted-average interest rates for total long-term debt, including the effects of related derivative instruments, were 1.43% and 1.59% as of December 31, 2021 and 2020, respectively.

JPMorgan Chase & Co. has guaranteed certain long-term debt of its subsidiaries, including structured notes. These guarantees rank on parity with the Firm's other unsecured and unsubordinated indebtedness. The amount of such guaranteed long-term debt and structured notes was \$16.4 billion and \$13.8 billion at December 31, 2021 and 2020, respectively.

The Firm's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Firm's credit ratings, financial ratios, earnings or stock price.

Note 21 – Preferred stock

At December 31, 2021 and 2020, JPMorgan Chase was authorized to issue 200 million shares of preferred stock, in one or more series, with a par value of \$1 per share. In the event of a liquidation or dissolution of the Firm, JPMorgan Chase's preferred stock then outstanding takes precedence over the Firm's common stock with respect to the payment of dividends and the distribution of assets.

The following is a summary of JPMorgan Chase's non-cumulative preferred stock outstanding as of December 31, 2021 and 2020.

	Shares ^(a)		Carrying value (in millions)		Issue date	Contractual rate in effect at December 31, 2021	Earliest redemption date ^(b)	Floating annualized rate ^(c)	Dividend declared per share ^(d)			
	December 31,		December 31,						Year ended December 31,			
	2021	2020	2021	2020					2021	2020	2019	
Fixed-rate:												
Series P	–	–	\$ –	\$ –	2/5/2013	– %	3/1/2018	NA	\$–	\$–	\$545.00	
Series T	–	–	–	–	1/30/2014	–	3/1/2019	NA	–	–	167.50	
Series W	–	–	–	–	6/23/2014	–	9/1/2019	NA	–	–	472.50	
Series Y	–	–	–	–	2/12/2015	–	3/1/2020	NA	–	153.13	612.52	
Series AA	–	142,500	–	1,425	6/4/2015	–	9/1/2020	NA	305.00	610.00	610.00	
Series BB	–	115,000	–	1,150	7/29/2015	–	9/1/2020	NA	307.50	615.00	615.00	
Series DD	169,625	169,625	1,696	1,696	9/21/2018	5.750	12/1/2023	NA	575.00	575.00	575.00	
Series EE	185,000	185,000	1,850	1,850	1/24/2019	6.000	3/1/2024	NA	600.00	600.00	511.67	(e)
Series GG	90,000	90,000	900	900	11/7/2019	4.750	12/1/2024	NA	475.00	506.67	NA	(e)
Series JJ	150,000	–	1,500	–	3/17/2021	4.550	6/1/2026	NA	321.03	NA	NA	(e)
Series LL	185,000	–	1,850	–	5/20/2021	4.625	6/1/2026	NA	245.39	NA	NA	(e)
Series MM	200,000	–	2,000	–	7/29/2021	4.200	9/1/2026	NA	142.33	NA	NA	(e)
Fixed-to-floating-rate:												
Series I	293,375	293,375	\$ 2,934	\$ 2,934	4/23/2008	LIBOR + 3.47%	4/30/2018	LIBOR + 3.47%	\$370.38	\$428.03	\$593.23	
Series Q	150,000	150,000	1,500	1,500	4/23/2013	5.150	5/1/2023	LIBOR + 3.25	515.00	515.00	515.00	
Series R	150,000	150,000	1,500	1,500	7/29/2013	6.000	8/1/2023	LIBOR + 3.30	600.00	600.00	600.00	
Series S	200,000	200,000	2,000	2,000	1/22/2014	6.750	2/1/2024	LIBOR + 3.78	675.00	675.00	675.00	
Series U	100,000	100,000	1,000	1,000	3/10/2014	6.125	4/30/2024	LIBOR + 3.33	612.50	612.50	612.50	
Series V	250,000	250,000	2,500	2,500	6/9/2014	LIBOR + 3.32%	7/1/2019	LIBOR + 3.32	353.65	436.85	534.09	(f)
Series X	160,000	160,000	1,600	1,600	9/23/2014	6.100	10/1/2024	LIBOR + 3.33	610.00	610.00	610.00	
Series Z	200,000	200,000	2,000	2,000	4/21/2015	LIBOR + 3.80%	5/1/2020	LIBOR + 3.80	401.44	453.52	530.00	(g)
Series CC	125,750	125,750	1,258	1,258	10/20/2017	4.625	11/1/2022	LIBOR + 2.58	462.50	462.50	462.50	
Series FF	225,000	225,000	2,250	2,250	7/31/2019	5.000	8/1/2024	SOFR + 3.38	500.00	500.00	251.39	(e)
Series HH	300,000	300,000	3,000	3,000	1/23/2020	4.600	2/1/2025	SOFR + 3.125	460.00	470.22	NA	(e)
Series II	150,000	150,000	1,500	1,500	2/24/2020	4.000	4/1/2025	SOFR + 2.745	400.00	341.11	NA	(e)
Series KK	200,000	–	2,000	–	5/12/2021	3.650	6/1/2026	CMT + 2.85	201.76	NA	NA	(e)
Total preferred stock	3,483,750	3,006,250	\$ 34,838	\$ 30,063								

(a) Represented by depositary shares.

(b) Fixed-to-floating rate notes convert to a floating rate at the earliest redemption date.

(c) Floating annualized rate includes three-month LIBOR, three-month term SOFR or five-year Constant Maturity Treasury ("CMT") rate, as applicable, plus the spreads noted above.

(d) Dividends are declared quarterly. Dividends are payable quarterly on fixed-rate preferred stock. Dividends are payable semiannually on fixed-to-floating-rate preferred stock while at a fixed rate, and payable quarterly after converting to a floating rate.

(e) The initial dividend declared is prorated based on the number of days outstanding for the period. Dividends were declared quarterly thereafter at the contractual rate.

(f) The dividend rate for Series V preferred stock became floating and payable quarterly starting on July 1, 2019; prior to which the dividend rate was fixed at 5% or \$250.00 per share payable semi annually.

(g) The dividend rate for Series Z preferred stock became floating and payable quarterly starting on May 1, 2020; prior to which the dividend rate was fixed at 5.3% or \$265.00 per share payable semi annually.

Each series of preferred stock has a liquidation value and redemption price per share of \$10,000, plus accrued but unpaid dividends. The aggregate liquidation value was \$35.2 billion at December 31, 2021.

Notes to consolidated financial statements

Redemptions

On February 1, 2022, the Firm redeemed all \$2.0 billion of its fixed-to-floating rate non-cumulative preferred stock, Series Z.

On June 1, 2021, the Firm redeemed all \$1.43 billion of its 6.10% non-cumulative preferred stock, Series AA and all \$1.15 billion of its 6.15% non-cumulative preferred stock, Series BB.

On March 1, 2020, the Firm redeemed all \$1.43 billion of its 6.125% non-cumulative preferred stock, Series Y.

Redemption rights

Each series of the Firm's preferred stock may be redeemed on any dividend payment date on or after the earliest redemption date for that series. All outstanding preferred stock series except Series I may also be redeemed following a "capital treatment event," as described in the terms of each series. Any redemption of the Firm's preferred stock is subject to non-objection from the Board of Governors of the Federal Reserve System (the "Federal Reserve").

Note 22 – Common stock

At December 31, 2021 and 2020, JPMorgan Chase was authorized to issue 9.0 billion shares of common stock with a par value of \$1 per share.

Common shares issued (reissuances from treasury) by JPMorgan Chase during the years ended December 31, 2021, 2020 and 2019 were as follows.

Year ended December 31, (in millions)	2021	2020	2019
Total issued – balance at January 1	4,104.9	4,104.9	4,104.9
Treasury – balance at January 1	(1,055.5)	(1,020.9)	(829.1)
Repurchase	(119.7)	(50.0)	(213.0)
Reissuance:			
Employee benefits and compensation plans	13.5	14.2	20.4
Employee stock purchase plans	0.9	1.2	0.8
Total reissuance	14.4	15.4	21.2
Total treasury – balance at December 31	(1,160.8)	(1,055.5)	(1,020.9)
Outstanding at December 31	2,944.1	3,049.4	3,084.0

On December 18, 2020, the Federal Reserve announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021. Subsequently, the Firm announced that its Board of Directors authorized a new common share repurchase program for up to \$30 billion. As directed by the Federal Reserve, total net repurchases and common stock dividends in the first and second quarters of 2021 were restricted and could not exceed the average of the Firm's net income for the four preceding calendar quarters.

On June 24, 2021, the Federal Reserve announced that the temporary restrictions on capital distributions would expire on June 30, 2021 as a result of the Firm remaining above its minimum risk-based capital requirements under the 2021 CCAR stress test. Effective July 1, 2021, the Firm became subject to the normal capital distribution restrictions provided under the regulatory capital framework. The Firm continues to be authorized to repurchase common shares under its existing common share repurchase program previously approved by the Board of Directors.

The following table sets forth the Firm's repurchases of common stock for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions)	2021	2020 ^(a)	2019
Total number of shares of common stock repurchased	119.7	50.0	213.0
Aggregate purchase price of common stock repurchases	\$18,448	\$ 6,397	\$24,121

(a) On March 15, 2020, in response to the economic disruptions caused by the COVID-19 pandemic, the Firm temporarily suspended repurchases of its common stock. Subsequently, the Federal Reserve directed all large banks, including the Firm, to discontinue net share repurchases through the end of 2020.

The authorization to repurchase common shares is utilized at management's discretion, and the timing of purchases and the exact amount of common shares that may be repurchased is subject to various factors, including market conditions; legal and regulatory considerations affecting the amount and timing of repurchase activity; the Firm's capital position (taking into account goodwill and intangibles); internal capital generation; and alternative investment opportunities. The repurchase program does not include specific price targets or timetables; may be suspended by management at any time; and may be executed through open market purchases or privately negotiated transactions, or utilizing Rule 10b5-1 plans, which are written trading plans that the Firm may enter into from time to time under Rule 10b5-1 of the Securities Exchange Act of 1934 and which allow the Firm to repurchase its common shares during periods when it may otherwise not be repurchasing common shares –for example, during internal trading blackout periods.

As of December 31, 2021, approximately 58.3 million shares of common stock were reserved for issuance under various employee incentive, compensation, option and stock purchase plans, and directors' compensation plans.

Notes to consolidated financial statements

Note 23 – Earnings per share

Basic earnings per share (“EPS”) is calculated using the two-class method. Under the two-class method, all earnings (distributed and undistributed) are allocated to common stock and participating securities. JPMorgan Chase grants RSUs under its share-based compensation programs, predominantly all of which entitle recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to dividends paid to holders of the Firm’s common stock. These unvested RSUs meet the definition of participating securities based on their respective rights to receive nonforfeitable dividends, and they are treated as a separate class of securities in computing basic EPS.

Participating securities are not included as incremental shares in computing diluted EPS; refer to Note 9 for additional information.

Diluted EPS incorporates the potential impact of contingently issuable shares, including awards which require future service as a condition of delivery of the underlying common stock. Diluted EPS is calculated under both the two-class and treasury stock methods, and the more dilutive amount is reported. For each of the periods presented in the table below, diluted EPS calculated under the two-class method was more dilutive.

The following table presents the calculation of net income applicable to common stockholders and basic and diluted EPS for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions, except per share amounts)	2021	2020	2019
Basic earnings per share			
Net income	\$ 48,334	\$ 29,131	\$ 36,431
Less: Preferred stock dividends	1,600	1,583	1,587
Net income applicable to common equity	46,734	27,548	34,844
Less: Dividends and undistributed earnings allocated to participating securities	231	138	202
Net income applicable to common stockholders	\$ 46,503	\$ 27,410	\$ 34,642
Total weighted-average basic shares outstanding	3,021.5	3,082.4	3,221.5
Net income per share	\$ 15.39	\$ 8.89	\$ 10.75
Diluted earnings per share			
Net income applicable to common stockholders	\$ 46,503	\$ 27,410	\$ 34,642
Total weighted-average basic shares outstanding	3,021.5	3,082.4	3,221.5
Add: Dilutive impact of SARs and employee stock options, unvested PSUs and nondividend-earning RSUs, and warrants	5.1	5.0	8.9
Total weighted-average diluted shares outstanding	3,026.6	3,087.4	3,230.4
Net income per share	\$ 15.36	\$ 8.88	\$ 10.72

Note 24 - Accumulated other comprehensive income/(loss)

AOCI includes the after-tax change in unrealized gains and losses on investment securities, foreign currency translation adjustments (including the impact of related derivatives), fair value changes of excluded components on fair value hedges, cash flow hedging activities, net loss and prior service costs/(credit) related to the Firm's defined benefit pension and OPEB plans, and fair value option-elected liabilities arising from changes in the Firm's own credit risk (DVA).

Year ended December 31, (in millions)	Unrealized gains/(losses) on investment securities	Translation adjustments, net of hedges	Fair value hedges	Cash flow hedges	Defined benefit pension and OPEB plans	DVA on fair value option elected liabilities	Accumulated other comprehensive income/(loss)
Balance at December 31, 2018	\$ 1,202	\$ (727)	\$ (161)	\$ (109)	\$ (2,308)	\$ 596	\$ (1,507)
Net change	2,855	20	30	172	964	(965)	3,076
Balance at December 31, 2019	\$ 4,057	\$ (707)	\$ (131)	\$ 63	\$ (1,344)	\$ (369)	\$ 1,569
Net change	4,123	234	19	2,320	212	(491)	6,417
Balance at December 31, 2020	\$ 8,180	\$ (473)	\$ (112)	\$ 2,383	\$ (1,132)	\$ (860)	\$ 7,986
Net change	(5,540)	(461)	(19)	(2,679)	922	(293)	(8,070)
Balance at December 31, 2021	\$ 2,640 ^(a)	\$ (934)	\$ (131)	\$ (296)	\$ (210)	\$ (1,153)	\$ (84)

(a) Includes after-tax net unamortized unrealized gains of \$2.4 billion related to AFS securities that have been transferred to HTM. Refer to Note 10 for further information.

Notes to consolidated financial statements

The following table presents the pre-tax and after-tax changes in the components of OCI.

Year ended December 31, (in millions)	2021			2020			2019		
	Pre-tax	Tax effect	After-tax	Pre-tax	Tax effect	After-tax	Pre-tax	Tax effect	After-tax
Unrealized gains/(losses) on investment securities:									
Net unrealized gains/(losses) arising during the period	\$ (7,634)	\$ 1,832	\$ (5,802)	\$ 6,228	\$ (1,495)	\$ 4,733	\$ 4,025	\$ (974)	\$ 3,051
Reclassification adjustment for realized (gains)/losses included in net income ^(a)	345	(83)	262	(802)	192	(610)	(258)	62	(196)
Net change	(7,289)	1,749	(5,540)	5,426	(1,303)	4,123	3,767	(912)	2,855
Translation adjustments^(b):									
Translation	(2,447)	125	(2,322)	1,407	(103)	1,304	(49)	33	(16)
Hedges	2,452	(591)	1,861	(1,411)	341	(1,070)	46	(10)	36
Net change	5	(466)	(461)	(4)	238	234	(3)	23	20
Fair value hedges, net change^(c):	(26)	7	(19)	25	(6)	19	39	(9)	30
Cash flow hedges:									
Net unrealized gains/(losses) arising during the period	(2,303)	553	(1,750)	3,623	(870)	2,753	122	(28)	94
Reclassification adjustment for realized (gains)/losses included in net income ^(d)	(1,222)	293	(929)	(570)	137	(433)	103	(25)	78
Net change	(3,525)	846	(2,679)	3,053	(733)	2,320	225	(53)	172
Defined benefit pension and OPEB plans, net change:	1,129	(207)	922	214	(2)	212	1,157	(193)	964
DVA on fair value option elected liabilities, net change:	(393)	100	(293)	(648)	157	(491)	(1,264)	299	(965)
Total other comprehensive income/(loss)	\$(10,099)	\$ 2,029	\$(8,070)	\$ 8,066	\$(1,649)	\$ 6,417	\$ 3,921	\$(845)	\$ 3,076

- (a) The pre-tax amount is reported in Investment securities gains/(losses) in the Consolidated statements of income.
- (b) Reclassifications of pre-tax realized gains/(losses) on translation adjustments and related hedges are reported in other income/expense in the Consolidated statements of income. During the year ended December 31, 2021, the Firm reclassified a net pre-tax loss of \$7 million to other expense related to the liquidation of certain legal entities, driven by cumulative translation adjustments. During the year ended December 31, 2020, the Firm reclassified a net pre-tax gain of \$6 million to other income related to the liquidation of legal entities, \$3 million related to net investment hedge gains and \$3 million related to cumulative translation adjustments. During the year ended December 31, 2019, the Firm reclassified net pre-tax gains of \$7 million to other income and \$1 million to other expense, respectively. These amounts, which related to the liquidation of certain legal entities, are comprised of \$18 million related to net investment hedge gains and \$10 million related to cumulative translation adjustments.
- (c) Represents changes in fair value of cross-currency swaps attributable to changes in cross-currency basis spreads, which are excluded from the assessment of hedge effectiveness and recorded in other comprehensive income. The initial cost of cross-currency basis spreads is recognized in earnings as part of the accrual of interest on the cross-currency swap.
- (d) The pre-tax amounts are primarily recorded in noninterest revenue, net interest income and compensation expense in the Consolidated statements of income.

Note 25 – Income taxes

JPMorgan Chase and its eligible subsidiaries file a consolidated U.S. federal income tax return. JPMorgan Chase uses the asset and liability method to provide income taxes on all transactions recorded in the Consolidated Financial Statements. This method requires that income taxes reflect the expected future tax consequences of temporary differences between the carrying amounts of assets or liabilities for book and tax purposes. Accordingly, a deferred tax asset or liability for each temporary difference is determined based on the tax rates that the Firm expects to be in effect when the underlying items of income and expense are realized. JPMorgan Chase's expense for income taxes includes the current and deferred portions of that expense. A valuation allowance is established to reduce deferred tax assets to the amount the Firm expects to realize.

Due to the inherent complexities arising from the nature of the Firm's businesses, and from conducting business and being taxed in a substantial number of jurisdictions, significant judgments and estimates are required to be made. Agreement of tax liabilities between JPMorgan Chase and the many tax jurisdictions in which the Firm files tax returns may not be finalized for several years. Thus, the Firm's final tax-related assets and liabilities may ultimately be different from those currently reported.

In the first quarter of 2021, the Firm reclassified certain deferred investment tax credits from accounts payable and other liabilities to other assets to be a reduction to the carrying value of the associated tax-oriented investments. The reclassification also resulted in an increase in income tax expense and a corresponding increase in other income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation, including the Firm's effective income tax rate.

Effective tax rate and expense

The following table presents a reconciliation of the applicable statutory U.S. federal income tax rate to the effective tax rate.

Effective tax rate

Year ended December 31,	2021	2020	2019
Statutory U.S. federal tax rate	21.0 %	21.0 %	21.0 %
Increase/(decrease) in tax rate resulting from:			
U.S. state and local income taxes, net of U.S. federal income tax benefit	3.0	2.5	3.5
Tax-exempt income	(0.9)	(1.6)	(1.4)
Non-U.S. earnings	0.1	1.4	1.8
Business tax credits	(4.2)	(5.4) ^(a)	(3.8) ^(a)
Tax audit resolutions	–	–	(2.3)
Other, net	(0.1)	0.8 ^(a)	–
Effective tax rate	18.9 %	18.7 %	18.8 %

(a) Prior-period amounts have been revised to conform with the current presentation.

The following table reflects the components of income tax expense/(benefit) included in the Consolidated statements of income.

Income tax expense/(benefit)

Year ended December 31, (in millions)	2021	2020	2019
Current income tax expense/ (benefit)			
U.S. federal	\$ 2,865	\$ 5,759	\$ 3,284
Non-U.S.	2,718	2,705	2,103
U.S. state and local	1,897	1,793	1,778
Total current income tax expense/ (benefit)	7,480	10,257	7,165
Deferred income tax expense/ (benefit)			
U.S. federal	3,460	(2,776) ^(a)	1,030 ^(a)
Non-U.S.	(101)	(126)	20
U.S. state and local	389	(671)	220
Total deferred income tax expense/(benefit)	3,748	(3,573)	1,270
Total income tax expense	\$11,228	\$6,684	\$ 8,435

(a) Prior-period amount has been revised to conform with the current presentation.

Total income tax expense includes \$69 million tax expense, and \$72 million and \$1.1 billion of tax benefits recorded in 2021, 2020, and 2019, respectively, resulting from the resolution of tax audits.

Tax effect of items recorded in stockholders' equity

The preceding table does not reflect the tax effect of certain items that are recorded each period directly in stockholders' equity. The tax effect of all items recorded directly to stockholders' equity resulted in an increase of \$2.0 billion in 2021 and decreases of \$827 million and \$862 million in 2020 and 2019, respectively.

Results from non-U.S. earnings

The following table presents the U.S. and non-U.S. components of income before income tax expense.

Year ended December 31, (in millions)	2021	2020	2019
U.S.	\$50,126	\$27,312 ^(b)	\$36,991 ^(b)
Non-U.S. ^(a)	9,436	8,503	7,875
Income before income tax expense	\$59,562	\$35,815	\$44,866

(a) For purposes of this table, non-U.S. income is defined as income generated from operations located outside the U.S.

(b) Prior-period amount has been revised to conform with the current presentation.

The Firm will recognize any U.S. income tax expense it may incur on global intangible low tax income as income tax expense in the period in which the tax is incurred.

Notes to consolidated financial statements

Affordable housing tax credits

The Firm recognized \$1.7 billion of tax credits and other tax benefits associated with investments in affordable housing projects within income tax expense for the year ended 2021, and \$1.5 billion in each of the years ended 2020 and 2019. The amount of amortization of such investments reported in income tax expense was \$1.3 billion, \$1.2 billion and \$1.1 billion, respectively. The carrying value of these investments, which are reported in other assets on the Firm's Consolidated balance sheets, was \$10.8 billion and \$9.7 billion at December 31, 2021 and 2020, respectively. The amount of commitments related to these investments, which are reported in accounts payable and other liabilities on the Firm's Consolidated balance sheets, was \$4.6 billion and \$3.8 billion at December 31, 2021 and 2020, respectively.

Deferred taxes

Deferred income tax expense/(benefit) results from differences between assets and liabilities measured for financial reporting purposes versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. If a deferred tax asset is determined to be unrealizable, a valuation allowance is established. The significant components of deferred tax assets and liabilities are reflected in the following table.

December 31, (in millions)	2021	2020
Deferred tax assets		
Allowance for loan losses	\$ 4,345	\$ 7,270
Employee benefits	987	1,104
Accrued expenses and other	3,955	3,332
Non-U.S. operations	900	849
Tax attribute carryforwards	615	757
Gross deferred tax assets	10,802	13,312
Valuation allowance	(378)	(560)
Deferred tax assets, net of valuation allowance	\$ 10,424	\$ 12,752
Deferred tax liabilities		
Depreciation and amortization	\$ 3,289	\$ 3,329
Mortgage servicing rights, net of hedges	2,049	2,184
Leasing transactions	4,227	5,124
Other, net	4,459	6,025
Gross deferred tax liabilities	14,024	16,662
Net deferred tax (liabilities)/assets	\$ (3,600)	\$ (3,910)

JPMorgan Chase has recorded deferred tax assets of \$615 million at December 31, 2021, in connection with U.S. federal and non-U.S. NOL carryforwards and other tax attributes, FTC carryforwards, and state and local capital loss carryforwards. At December 31, 2021, total U.S. federal NOL carryforwards were \$972 million, non-U.S. NOL carryforwards were \$210 million, FTC carryforwards were \$258 million, state and local capital loss carryforwards were \$1.1 billion, and other U.S. federal tax attributes were \$359 million. If not utilized, a portion of the U.S. federal NOL carryforwards and other U.S. federal tax attributes will expire between 2026 and 2037 whereas others have an unlimited carryforward period. Similarly, certain non-U.S. NOL carryforwards will expire between 2026 and 2036 whereas others have an unlimited carryforward period. The FTC carryforwards will expire between 2029 and 2030, and the state and local capital loss carryforwards will expire in 2022.

The valuation allowance at December 31, 2021, was due to the state and local capital loss carryforwards, FTC carryforwards, and certain non-U.S. deferred tax assets, including NOL carryforwards.

Unrecognized tax benefits

At December 31, 2021, 2020 and 2019, JPMorgan Chase's unrecognized tax benefits, excluding related interest expense and penalties, were \$4.6 billion, \$4.3 billion and \$4.0 billion, respectively, of which \$3.4 billion, \$3.1 billion and \$2.8 billion, respectively, if recognized, would reduce the annual effective tax rate. Included in the amount of unrecognized tax benefits are certain items that would not affect the effective tax rate if they were recognized in the Consolidated statements of income. These unrecognized items include the tax effect of certain temporary differences, the portion of gross state and local unrecognized tax benefits that would be offset by the benefit from associated U.S. federal income tax deductions, and the portion of gross non-U.S. unrecognized tax benefits that would have offsets in other jurisdictions. JPMorgan Chase is presently under audit by a number of taxing authorities, most notably by the Internal Revenue Service as summarized in the Tax examination status table below. As JPMorgan Chase is presently under audit by a number of taxing authorities, it is reasonably possible that over the next 12 months the resolution of these examinations may increase or decrease the gross balance of unrecognized tax benefits by as much as approximately \$300 million. Upon settlement of an audit, the change in the unrecognized tax benefit would result from payment or income statement recognition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits.

Year ended December 31, (in millions)	2021	2020	2019
Balance at January 1,	\$ 4,250	\$ 4,024	\$ 4,861
Increases based on tax positions related to the current period	798	685	871
Increases based on tax positions related to prior periods	393	362	10
Decreases based on tax positions related to prior periods	(657)	(705)	(706)
Decreases related to cash settlements with taxing authorities	(148)	(116)	(1,012)
Balance at December 31,	\$ 4,636	\$ 4,250	\$ 4,024

After-tax interest expense/(benefit) and penalties related to income tax liabilities recognized in income tax expense were \$174 million, \$147 million and \$(52) million in 2021, 2020 and 2019, respectively.

At December 31, 2021 and 2020, in addition to the liability for unrecognized tax benefits, the Firm had accrued \$1.1 billion and \$1.0 billion, respectively, for income tax-related interest and penalties.

Tax examination status

JPMorgan Chase is continually under examination by the Internal Revenue Service, by taxing authorities throughout the world, and by many state and local jurisdictions throughout the U.S. The following table summarizes the status of significant income tax examinations of JPMorgan Chase and its consolidated subsidiaries as of December 31, 2021.

	Periods under examination	Status
JPMorgan Chase - U.S.	2011 - 2013	Field examination of amended returns
JPMorgan Chase - U.S.	2014 - 2018	Field Examination
JPMorgan Chase - New York State	2012 - 2014	Field Examination
JPMorgan Chase - New York City	2015 - 2017	Field Examination
JPMorgan Chase - California	2011 - 2012	Field Examination
JPMorgan Chase - U.K.	2006 - 2019	Field examination of certain select entities

Note 26 – Restricted cash, other restricted assets and intercompany funds transfers

Restricted cash and other restricted assets

Certain of the Firm’s cash and other assets are restricted as to withdrawal or usage. These restrictions are imposed by various regulatory authorities based on the particular activities of the Firm’s subsidiaries.

The business of JPMorgan Chase Bank, N.A. is subject to examination and regulation by the OCC. The Bank is a member of the U.S. Federal Reserve System, and its deposits in the U.S. are insured by the FDIC, subject to applicable limits.

The Firm is required to maintain cash reserves at certain non-US central banks.

The Firm is also subject to rules and regulations established by other U.S. and non U.S. regulators. As part of its compliance with the respective regulatory requirements, the Firm’s broker-dealer activities are subject to certain restrictions on cash and other assets.

The following table presents the components of the Firm’s restricted cash:

December 31, (in billions)	2021	2020
Segregated for the benefit of securities and cleared derivative customers	14.6	19.3
Cash reserves at non-U.S. central banks and held for other general purposes	5.1	5.1
Total restricted cash^(a)	\$ 19.7	\$ 24.4

(a) Comprises \$18.4 billion and \$22.7 billion in deposits with banks, and \$1.3 billion and \$1.7 billion in cash and due from banks on the Consolidated balance sheets as of December 31, 2021 and 2020, respectively.

Also, as of December 31, 2021 and 2020, the Firm had the following other restricted assets:

- Cash and securities pledged with clearing organizations for the benefit of customers of \$47.5 billion and \$37.2 billion, respectively.
- Securities with a fair value of \$30.0 billion and \$1.3 billion, respectively, were also restricted in relation to customer activity.

Intercompany funds transfers

Restrictions imposed by U.S. federal law prohibit JPMorgan Chase Bank, N.A., and its subsidiaries, from lending to JPMorgan Chase & Co. (“Parent Company”) and certain of its affiliates unless the loans are secured in specified amounts. Such secured loans provided by any banking subsidiary to the Parent Company or to any particular affiliate, together with certain other transactions with such affiliate (collectively referred to as “covered transactions”), must be made on terms and conditions that are consistent with safe and sound banking practices. In addition, unless collateralized with cash or US Government debt obligations, covered transactions are generally limited to 10% of the banking subsidiary’s total capital, as determined by the risk-based capital guidelines; the aggregate amount of covered transactions between any banking subsidiary and all of its affiliates is limited to 20% of the banking subsidiary’s total capital.

The Parent Company’s two principal subsidiaries are JPMorgan Chase Bank, N.A. and JPMorgan Chase Holdings LLC, an intermediate holding company (the “IHC”). The IHC generally holds the stock of JPMorgan Chase’s subsidiaries other than JPMorgan Chase Bank, N.A. and its subsidiaries. The IHC also owns other assets and provides intercompany loans to the Parent Company. The Parent Company is obligated to contribute to the IHC substantially all the net proceeds received from securities issuances (including issuances of senior and subordinated debt securities and of preferred and common stock).

The principal sources of income and funding for the Parent Company are dividends from JPMorgan Chase Bank, N.A. and dividends and extensions of credit from the IHC. In addition to dividend restrictions set forth in statutes and regulations, the Federal Reserve, the OCC and the FDIC have authority under the Financial Institutions Supervisory Act to prohibit or to limit the payment of dividends by the banking organizations they supervise, including the Parent Company and its subsidiaries that are banks or bank holding companies, if, in the banking regulator’s opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization. The IHC is prohibited from paying dividends or extending credit to the Parent Company if certain capital or liquidity “thresholds” are breached or if limits are otherwise imposed by the Parent Company’s management or Board of Directors.

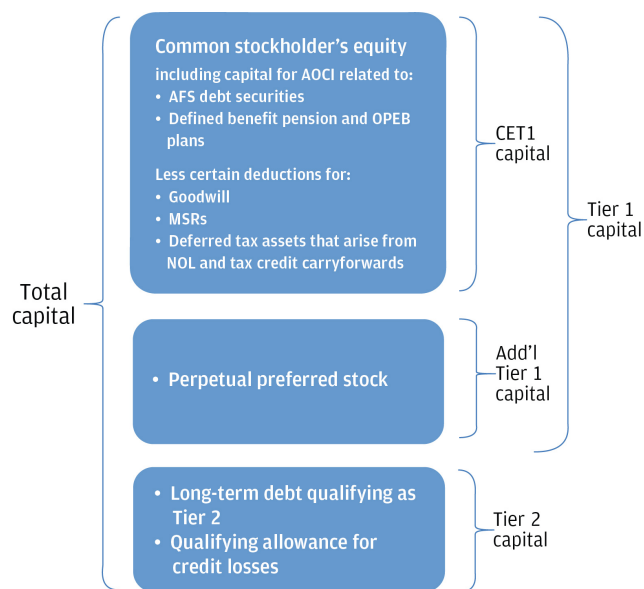
At January 1, 2022, the Parent Company’s banking subsidiaries could pay, in the aggregate, approximately \$20 billion in dividends to their respective bank holding companies without the prior approval of their relevant banking regulators. The capacity to pay dividends in 2022 will be supplemented by the banking subsidiaries’ earnings during the year.

Note 27 – Regulatory capital

The Federal Reserve establishes capital requirements, including well-capitalized requirements, for the consolidated financial holding company. The OCC establishes similar minimum capital requirements and standards for the Firm’s principal IDI subsidiary, JPMorgan Chase Bank, N.A.

The capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for large and internationally active U.S. bank holding companies and banks, including the Firm and its IDI subsidiaries, including JPMorgan Chase Bank, N.A. Two comprehensive approaches are prescribed for calculating RWA: a standardized approach (“Basel III Standardized”), and an advanced approach (“Basel III Advanced”). For each of the risk-based capital ratios, the capital adequacy of the Firm and JPMorgan Chase Bank, N.A. is evaluated against the lower of the Standardized or Advanced approaches compared to their respective regulatory capital ratio requirements.

The three components of regulatory capital under the Basel III rules are as illustrated below:



Under the risk-based capital and leverage-based guidelines of the Federal Reserve, JPMorgan Chase is required to maintain minimum ratios for CET1 capital, Tier 1 capital, Total capital, Tier 1 leverage and the SLR. Failure to meet these minimum requirements could cause the Federal Reserve to take action. IDI subsidiaries are also subject to these capital requirements established by their respective primary regulators.

The following table presents the risk-based regulatory capital ratio requirements and well-capitalized ratios to which the Firm and its IDI subsidiaries were subject as of December 31, 2021 and 2020.

	Standardized capital ratio requirements		Advanced capital ratio requirements		Well-capitalized ratios	
	BHC ^{(a)(b)}	IDI ^(c)	BHC ^(a)	IDI ^(c)	BHC ^(d)	IDI ^(e)
Risk-based capital ratios						
CET1 capital	11.2 %	7.0 %	10.5 %	7.0 %	NA	6.5 %
Tier 1 capital	12.7	8.5	12.0	8.5	6.0 %	8.0
Total capital	14.7	10.5	14.0	10.5	10.0	10.0

Note: The table above is as defined by the regulations issued by the Federal Reserve, OCC and FDIC and to which the Firm and its IDI subsidiaries are subject.

- Represents the regulatory capital ratio requirements applicable to the Firm. The CET1, Tier 1 and Total capital ratio requirements each include a respective minimum requirement plus a GSIB surcharge of 3.5% as calculated under Method 2; plus a 3.2% SCB for Basel III Standardized ratios and a fixed 2.5% capital conservation buffer for Basel III Advanced ratios. The countercyclical buffer is currently set to 0% by the federal banking agencies.
- For the period ended December 31, 2020, the CET1, Tier 1, and Total capital ratio requirements under Basel III Standardized applicable to the Firm were 11.3%, 12.8% and 14.8%, respectively.
- Represents requirements for JPMorgan Chase’s IDI subsidiaries. The CET1, Tier 1 and Total capital ratio requirements include a fixed capital conservation buffer requirement of 2.5% that is applicable to the IDI subsidiaries. The IDI subsidiaries are not subject to the GSIB surcharge.
- Represents requirements for bank holding companies pursuant to regulations issued by the Federal Reserve.
- Represents requirements for IDI subsidiaries pursuant to regulations issued under the FDIC Improvement Act.

The following table presents the leverage-based regulatory capital ratio requirements and well-capitalized ratios to which the Firm and its IDI subsidiaries were subject as of December 31, 2021 and 2020.

	Capital ratio requirements ^(a)		Well-capitalized ratios	
	BHC	IDI	BHC ^(b)	IDI
Leverage-based capital ratios				
Tier 1 leverage	4.0 %	4.0 %	NA	5.0 %
SLR	5.0	6.0	NA	6.0

Note: The table above is as defined by the regulations issued by the Federal Reserve, OCC and FDIC and to which the Firm and its IDI subsidiaries are subject.

- Represents minimum SLR requirement of 3.0%, as well as supplementary leverage buffer requirements of 2.0% and 3.0% for BHC and IDI subsidiaries, respectively.
- The Federal Reserve's regulations do not establish well-capitalized thresholds for these measures for BHCs.

Notes to consolidated financial statements

Current Expected Credit Losses

The Firm elected to apply the CECL capital transition provisions as permitted by the federal banking agencies delaying the effects of CECL on regulatory capital for two years until January 1, 2022, followed by a three-year transition period (“CECL capital transition provisions”).

As of December 31, 2021, the capital metrics of the Firm reflected the benefit of the CECL capital transition

provisions of \$2.9 billion, which will be phased in at 25% per year beginning January 1, 2022.

The CECL capital transition provisions have also been incorporated into Tier 2 capital, adjusted average assets, and total leverage exposure and are also subject to the three-year transition period beginning January 1, 2022.

The following tables present risk-based capital metrics under both the Basel III Standardized and Basel III Advanced approaches and leverage-based capital metrics for JPMorgan Chase and JPMorgan Chase Bank, N.A. As of December 31, 2021 and 2020, JPMorgan Chase and JPMorgan Chase Bank, N.A. were well-capitalized and met all capital requirements to which each was subject.

December 31, 2021 (in millions, except ratios)	Basel III Standardized		Basel III Advanced	
	JPMorgan Chase & Co. ^(a)	JPMorgan Chase Bank, N.A. ^(a)	JPMorgan Chase & Co. ^(a)	JPMorgan Chase Bank, N.A. ^(a)
Risk-based capital metrics:				
CET1 capital	\$ 213,942	\$ 266,907	\$ 213,942	\$ 266,907
Tier 1 capital	246,162	266,910	246,162	266,910
Total capital	274,900	281,826	265,796	272,299
Risk-weighted assets	1,638,900	1,582,280	1,547,920	1,392,847
CET1 capital ratio	13.1 %	16.9 %	13.8 %	19.2 %
Tier 1 capital ratio	15.0	16.9	15.9	19.2
Total capital ratio	16.8	17.8	17.2	19.5

December 31, 2020 (in millions, except ratios)	Basel III Standardized		Basel III Advanced	
	JPMorgan Chase & Co. ^(a)	JPMorgan Chase Bank, N.A. ^(a)	JPMorgan Chase & Co. ^(a)	JPMorgan Chase Bank, N.A. ^(a)
Risk-based capital metrics:				
CET1 capital	\$ 205,078	\$ 234,235	\$ 205,078	\$ 234,235
Tier 1 capital	234,844	234,237	234,844	234,237
Total capital	269,923	252,045	257,228	239,673
Risk-weighted assets	1,560,609	1,492,138	1,484,431	1,343,185
CET1 capital ratio	13.1 %	15.7 %	13.8 %	17.4 %
Tier 1 capital ratio	15.0	15.7	15.8	17.4
Total capital ratio	17.3	16.9	17.3	17.8

(a) The capital metrics reflect the CECL capital transition provisions. Additionally, loans originated under the PPP receive a zero percent risk weight.

Three months ended (in millions, except ratios)	December 31, 2021		December 31, 2020	
	JPMorgan Chase & Co. ^(b)	JPMorgan Chase Bank, N.A. ^(b)	JPMorgan Chase & Co. ^{(b)(c)}	JPMorgan Chase Bank, N.A. ^{(b)(c)}
Leverage-based capital metrics:				
Adjusted average assets ^(a)	\$ 3,782,035	\$ 3,334,925	\$ 3,353,319	\$ 2,970,285
Tier 1 leverage ratio	6.5 %	8.0 %	7.0 %	7.9 %
Total leverage exposure	\$ 4,571,789	\$ 4,119,286	\$ 3,401,542	\$ 3,688,797
SLR	5.4 %	6.5 %	6.9 %	6.3 %

(a) Adjusted average assets, for purposes of calculating the leverage ratio, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets.

(b) The capital metrics reflect the CECL capital transition provisions.

(c) JPMorgan Chase's total leverage exposure for purposes of calculating the SLR, excludes on-balance sheet amounts of U.S. Treasury securities and deposits at Federal Reserve Banks, as provided by the interim final rule issued by the Federal Reserve which became effective April 1, 2020 and remained in effect through March 31, 2021. On June 1, 2020, the Federal Reserve, OCC and FDIC issued an interim final rule which became effective April 1, 2020 and remained in effect through March 31, 2021 that provides IDI subsidiaries with an option to apply this temporary exclusion subject to certain restrictions. JPMorgan Chase Bank, N.A. did not elect to apply this exclusion.

Note 28 – Off-balance sheet lending-related financial instruments, guarantees, and other commitments

JPMorgan Chase provides lending-related financial instruments (e.g., commitments and guarantees) to address the financing needs of its customers and clients. The contractual amount of these financial instruments represents the maximum possible credit risk to the Firm should the customer or client draw upon the commitment or the Firm be required to fulfill its obligation under the guarantee, and should the customer or client subsequently fail to perform according to the terms of the contract. Most of these commitments and guarantees have historically been refinanced, extended, cancelled, or expired without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Firm's view, representative of its expected future credit exposure or funding requirements.

To provide for expected credit losses in wholesale and certain consumer lending-related commitments, an allowance for credit losses on lending-related commitments is maintained. Refer to Note 13 for further information regarding the allowance for credit losses on lending-related commitments. The following table summarizes the contractual amounts and carrying values of off-balance sheet lending-related financial instruments, guarantees and other commitments at December 31, 2021 and 2020. The amounts in the table below for credit card and home equity lending-related commitments represent the total available credit for these products. The Firm has not experienced, and does not anticipate, that all available lines of credit for these products will be utilized at the same time. The Firm can reduce or cancel credit card lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. In addition, the Firm typically closes credit card lines when the borrower is 60 days or more past due. The Firm may reduce or close HELOCs when there are significant decreases in the value of the underlying property, or when there has been a demonstrable decline in the creditworthiness of the borrower.

Notes to consolidated financial statements

Off-balance sheet lending-related financial instruments, guarantees and other commitments

By remaining maturity at December 31, (in millions)	Contractual amount						Carrying value ⁽ⁱ⁾	
	2021					2020	2021	2020
	Expires in 1 year or less	Expires after 1 year through 3 years	Expires after 3 years through 5 years	Expires after 5 years	Total	Total		
Lending-related								
Consumer, excluding credit card:								
Residential Real Estate ^(a)	\$ 15,649	\$ 2,216	\$ 5,797	\$ 9,334	\$ 32,996	\$ 46,047	100	148
Auto and other	11,387	–	–	951	12,338	11,272	2	–
Total consumer, excluding credit card	27,036	2,216	5,797	10,285	45,334	57,319	102	148
Credit card ^(b)	730,534	–	–	–	730,534	658,506	–	–
Total consumer^{(b)(c)}	757,570	2,216	5,797	10,285	775,868	715,825	102	148
Wholesale:								
Other unfunded commitments to extend credit ^(d)	101,983	167,137	160,301	24,046	453,467	415,828	2,037	2,148
Standby letters of credit and other financial guarantees ^(d)	15,092	8,261	4,015	1,162	28,530	30,982	476	443
Other letters of credit ^(d)	3,854	498	96	–	4,448	3,053	9	14
Total wholesale^(c)	120,929	175,896	164,412	25,208	486,445	449,863	2,522	2,605
Total lending-related	\$ 878,499	\$ 178,112	\$ 170,209	\$ 35,493	\$ 1,262,313	\$ 1,165,688	\$ 2,624	\$ 2,753
Other guarantees and commitments								
Securities lending indemnification agreements and guarantees ^(e)	\$ 337,770	\$ –	\$ –	\$ –	\$ 337,770	\$ 250,418	\$ –	\$ –
Derivatives qualifying as guarantees	3,119	396	12,296	39,919	55,730	54,415	475	322
Unsettled resale and securities borrowed agreements	101,553	2,128	–	–	103,681	102,355 ^(h)	1	2
Unsettled repurchase and securities loaned agreements	73,631	632	–	–	74,263	104,901	–	(1)
Loan sale and securitization-related indemnifications:								
Mortgage repurchase liability	NA	NA	NA	NA	NA	NA	61	84
Loans sold with recourse	NA	NA	NA	NA	827	889	19	23
Exchange & clearing house guarantees and commitments ^(f)	182,701	–	–	–	182,701	142,003	–	–
Other guarantees and commitments ^(g)	5,028	2,980	283	2,199	10,490	9,639 ^(h)	69	52

(a) Includes certain commitments to purchase loans from correspondents.

(b) Also includes commercial card lending-related commitments primarily in CB and CIB.

(c) Predominantly all consumer and wholesale lending-related commitments are in the U.S.

(d) At December 31, 2021 and 2020, reflected the contractual amount net of risk participations totaling \$44 million and \$72 million, respectively, for other unfunded commitments to extend credit; \$7.9 billion and \$8.5 billion, respectively, for standby letters of credit and other financial guarantees; and \$451 million and \$357 million, respectively, for other letters of credit. In regulatory filings with the Federal Reserve these commitments are shown gross of risk participations.

(e) At December 31, 2021 and 2020, collateral held by the Firm in support of securities lending indemnification agreements was \$357.4 billion and \$264.3 billion, respectively. Securities lending collateral primarily consists of cash, G7 government securities, and securities issued by U.S. GSEs and government agencies.

(f) At December 31, 2021 and 2020, includes guarantees to the Fixed Income Clearing Corporation under the sponsored member repo program and commitments and guarantees associated with the Firm's membership in certain clearing houses.

(g) At December 31, 2021 and 2020, primarily includes unfunded commitments related to certain tax-oriented equity investments, unfunded commitments to purchase secondary market loans, and other equity investment commitments.

(h) Prior-period amounts have been revised to conform with the current presentation.

(i) For lending-related products, the carrying value represents the allowance for lending-related commitments and the guarantee liability; for derivative-related products, and lending-related commitments for which the fair value option was elected, the carrying value represents the fair value.

Other unfunded commitments to extend credit

Other unfunded commitments to extend credit generally consist of commitments for working capital and general corporate purposes, extensions of credit to support commercial paper facilities and bond financings in the event that those obligations cannot be remarketed to new investors, as well as committed liquidity facilities to clearing organizations. The Firm also issues commitments under multipurpose facilities which could be drawn upon in several forms, including the issuance of a standby letter of credit.

Guarantees

U.S. GAAP requires that a guarantor recognize, at the inception of a guarantee, a liability in an amount equal to the fair value of the obligation undertaken in issuing the guarantee. U.S. GAAP defines a guarantee as a contract that contingently requires the guarantor to pay a guaranteed party based upon: (a) changes in an underlying asset, liability or equity security of the guaranteed party; or (b) a third party's failure to perform under a specified agreement. The Firm considers the following off-balance sheet arrangements to be guarantees under U.S. GAAP: standby letters of credit and other financial guarantees, securities lending indemnifications, certain indemnification agreements included within third-party contractual arrangements, certain derivative contracts and the guarantees under the sponsored member repo program.

As required by U.S. GAAP, the Firm initially records guarantees at the inception date fair value of the non-contingent obligation assumed (e.g., the amount of consideration received or the net present value of the premium receivable). For these obligations, the Firm records this fair value amount in other liabilities with an offsetting entry recorded in cash (for premiums received),

The following table summarizes the contractual amount and carrying value of standby letters of credit and other financial guarantees and other letters of credit arrangements as of December 31, 2021 and 2020.

Standby letters of credit, other financial guarantees and other letters of credit

December 31, (in millions)	2021		2020	
	Standby letters of credit and other financial guarantees	Other letters of credit	Standby letters of credit and other financial guarantees	Other letters of credit
Investment-grade ^(a)	\$ 19,998	\$ 3,087	\$ 22,850	\$ 2,263
Noninvestment-grade ^(a)	8,532	1,361	8,132	790
Total contractual amount	\$ 28,530	\$ 4,448	\$ 30,982	\$ 3,053
Allowance for lending-related commitments	\$ 123	\$ 9	\$ 80	\$ 14
Guarantee liability	353	—	363	—
Total carrying value	\$ 476	\$ 9	\$ 443	\$ 14
Commitments with collateral	\$ 14,511	\$ 999	\$ 17,238	\$ 498

(a) The ratings scale is based on the Firm's internal risk ratings. Refer to Note 12 for further information on internal risk ratings.

or other assets (for premiums receivable). Any premium receivable recorded in other assets is reduced as cash is received under the contract, and the fair value of the liability recorded at inception is amortized into income as lending and deposit-related fees over the life of the guarantee contract. The lending-related contingent obligation is recognized based on expected credit losses in addition to, and separate from, any non-contingent obligation.

Non-lending-related contingent obligations are recognized when the liability becomes probable and reasonably estimable. These obligations are not recognized if the estimated amount is less than the carrying amount of any non-contingent liability recognized at inception (adjusted for any amortization). Examples of non-lending-related contingent obligations include indemnifications provided in sales agreements, where a portion of the sale proceeds is allocated to the guarantee, which adjusts the gain or loss that would otherwise result from the transaction. For these indemnifications, the initial liability is amortized to income as the Firm's risk is reduced (i.e., over time or when the indemnification expires).

The contractual amount and carrying value of guarantees and indemnifications are included in the table on page 284.

For additional information on the guarantees, see below.

Standby letters of credit and other financial guarantees
Standby letters of credit and other financial guarantees are conditional lending commitments issued by the Firm to guarantee the performance of a client or customer to a third party under certain arrangements, such as commercial paper facilities, bond financings, acquisition financings, trade financings and similar transactions.

Notes to consolidated financial statements

Securities lending indemnifications

Through the Firm's securities lending program, counterparties' securities, via custodial and non-custodial arrangements, may be lent to third parties. As part of this program, the Firm provides an indemnification in the lending agreements which protects the lender against the failure of the borrower to return the lent securities. To minimize its liability under these indemnification agreements, the Firm obtains cash or other highly liquid collateral with a market value exceeding 100% of the value of the securities on loan from the borrower. Collateral is marked to market daily to help assure that collateralization is adequate. Additional collateral is called from the borrower if a shortfall exists, or collateral may be released to the borrower in the event of overcollateralization. If a borrower defaults, the Firm would use the collateral held to purchase replacement securities in the market or to credit the lending client or counterparty with the cash equivalent thereof.

The cash collateral held by the Firm may be invested on behalf of the client in indemnified resale agreements, whereby the Firm indemnifies the client against the loss of principal invested. To minimize its liability under these agreements, the Firm obtains collateral with a market value exceeding 100% of the principal invested.

Derivatives qualifying as guarantees

The Firm transacts in certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. These contracts include written put options that require the Firm to purchase assets upon exercise by the option holder at a specified price by a specified date in the future. The Firm may enter into written put option contracts in order to meet client needs, or for other trading purposes. The terms of written put options are typically five years or less.

Derivatives deemed to be guarantees also includes stable value contracts, commonly referred to as "stable value products", that require the Firm to make a payment of the difference between the market value and the book value of a counterparty's reference portfolio of assets in the event that market value is less than book value and certain other conditions have been met. Stable value products are transacted in order to allow investors to realize investment returns with less volatility than an unprotected portfolio. These contracts are typically longer-term or may have no stated maturity, but allow the Firm to elect to terminate the contract under certain conditions.

The notional value of derivative guarantees generally represents the Firm's maximum exposure. However, exposure to certain stable value products is contractually limited to a substantially lower percentage of the notional amount.

The fair value of derivative guarantees reflects the probability, in the Firm's view, of whether the Firm will be required to perform under the contract. The Firm reduces exposures to these contracts by entering into offsetting transactions, or by entering into contracts that hedge the market risk related to the derivative guarantees.

The following table summarizes the derivatives qualifying as guarantees as of December 31, 2021 and 2020.

(in millions)	December 31, 2021	December 31, 2020
Notional amounts		
Derivative guarantees	\$ 55,730	\$ 54,415
Stable value contracts with contractually limited exposure	29,778	27,752
Maximum exposure of stable value contracts with contractually limited exposure	2,882	2,803
Fair value		
Derivative payables	475	322

In addition to derivative contracts that meet the characteristics of a guarantee, the Firm is both a purchaser and seller of credit protection in the credit derivatives market. Refer to Note 5 for a further discussion of credit derivatives.

Unsettled securities financing agreements

In the normal course of business, the Firm enters into resale and securities borrowed agreements. At settlement, these commitments result in the Firm advancing cash to and receiving securities collateral from the counterparty. The Firm also enters into repurchase and securities loaned agreements. At settlement, these commitments result in the Firm receiving cash from and providing securities collateral to the counterparty. Such agreements settle at a future date. These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated balance sheets until settlement date. These agreements predominantly have regular-way settlement terms. Refer to Note 11 for a further discussion of securities financing agreements.

Loan sales- and securitization-related indemnifications

Mortgage repurchase liability

In connection with the Firm's mortgage loan sale and securitization activities with U.S. GSEs the Firm has made representations and warranties that the loans sold meet certain requirements, and that may require the Firm to repurchase mortgage loans and/or indemnify the loan purchaser if such representations and warranties are breached by the Firm.

Private label securitizations

The liability related to repurchase demands associated with private label securitizations is separately evaluated by the Firm in establishing its litigation reserves.

Refer to Note 30 for additional information regarding litigation.

Loans sold with recourse

The Firm provides servicing for mortgages and certain commercial lending products on both a recourse and nonrecourse basis. In nonrecourse servicing, the principal credit risk to the Firm is the cost of temporary servicing advances of funds (i.e., normal servicing advances). In recourse servicing, the servicer agrees to share credit risk

with the owner of the mortgage loans, such as Fannie Mae or Freddie Mac or a private investor, insurer or guarantor. Losses on recourse servicing predominantly occur when foreclosure sales proceeds of the property underlying a defaulted loan are less than the sum of the outstanding principal balance, plus accrued interest on the loan and the cost of holding and disposing of the underlying property. The Firm's securitizations are predominantly nonrecourse, thereby effectively transferring the risk of future credit losses to the purchaser of the mortgage-backed securities issued by the trust. At December 31, 2021 and 2020, the unpaid principal balance of loans sold with recourse totaled \$827 million and \$889 million, respectively. The carrying value of the related liability that the Firm has recorded in accounts payable and other liabilities on the Consolidated balance sheets, which is representative of the Firm's view of the likelihood it will have to perform under its recourse obligations, was \$19 million and \$23 million at December 31, 2021 and 2020, respectively.

Other off-balance sheet arrangements

Indemnification agreements - general

In connection with issuing securities to investors outside the U.S., the Firm may agree to pay additional amounts to the holders of the securities in the event that, due to a change in tax law, certain types of withholding taxes are imposed on payments on the securities. The terms of the securities may also give the Firm the right to redeem the securities if such additional amounts are payable. The Firm may also enter into indemnification clauses in connection with the licensing of software to clients ("software licensees") or when it sells a business or assets to a third party ("third-party purchasers"), pursuant to which it indemnifies software licensees for claims of liability or damages that may occur subsequent to the licensing of the software, or third-party purchasers for losses they may incur due to actions taken by the Firm prior to the sale of the business or assets. It is difficult to estimate the Firm's maximum exposure under these indemnification arrangements, since this would require an assessment of future changes in tax law and future claims that may be made against the Firm that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

Merchant charge-backs

Under the rules of payment networks, the Firm, in its role as a merchant acquirer, retains a contingent liability for disputed processed credit and debit card transactions that result in a charge-back to the merchant. If a dispute is resolved in the cardholder's favor, Merchant Services will (through the cardholder's issuing bank) credit or refund the amount to the cardholder and will charge back the transaction to the merchant. If Merchant Services is unable to collect the amount from the merchant, Merchant Services will bear the loss for the amount credited or refunded to the cardholder. Merchant Services mitigates this risk by withholding future settlements, retaining cash reserve accounts or obtaining other collateral. In addition, Merchant

Services recognizes a valuation allowance that covers the payment or performance risk to the Firm related to charge-backs.

For the years ended December 31, 2021, 2020 and 2019, Merchant Services processed an aggregate volume of \$1,886.7 billion, \$1,597.3 billion, and \$1,511.5 billion, respectively.

Clearing Services - Client Credit Risk

The Firm provides clearing services for clients by entering into securities purchases and sales and derivative contracts with CCPs, including ETDs such as futures and options, as well as OTC-cleared derivative contracts. As a clearing member, the Firm stands behind the performance of its clients, collects cash and securities collateral (margin) as well as any settlement amounts due from or to clients, and remits them to the relevant CCP or client in whole or part. There are two types of margin: variation margin is posted on a daily basis based on the value of clients' derivative contracts and initial margin is posted at inception of a derivative contract, generally on the basis of the potential changes in the variation margin requirement for the contract.

As a clearing member, the Firm is exposed to the risk of nonperformance by its clients, but is not liable to clients for the performance of the CCPs. Where possible, the Firm seeks to mitigate its risk to the client through the collection of appropriate amounts of margin at inception and throughout the life of the transactions. The Firm can also cease providing clearing services if clients do not adhere to their obligations under the clearing agreement. In the event of nonperformance by a client, the Firm would close out the client's positions and access available margin. The CCP would utilize any margin it holds to make itself whole, with any remaining shortfalls required to be paid by the Firm as a clearing member.

The Firm reflects its exposure to nonperformance risk of the client through the recognition of margin receivables from clients and margin payables to CCPs; the clients' underlying securities or derivative contracts are not reflected in the Firm's Consolidated Financial Statements.

It is difficult to estimate the Firm's maximum possible exposure through its role as a clearing member, as this would require an assessment of transactions that clients may execute in the future. However, based upon historical experience, and the credit risk mitigants available to the Firm, management believes it is unlikely that the Firm will have to make any material payments under these arrangements and the risk of loss is expected to be remote.

Refer to Note 5 for information on the derivatives that the Firm executes for its own account and records in its Consolidated Financial Statements.

Notes to consolidated financial statements

Exchange & Clearing House Memberships

The Firm is a member of several securities and derivative exchanges and clearing houses, both in the U.S. and other countries, and it provides clearing services to its clients. Membership in some of these organizations requires the Firm to pay a pro rata share of the losses incurred by the organization as a result of the default of another member. Such obligations vary with different organizations. These obligations may be limited to the amount (or a multiple of the amount) of the Firm's contribution to the guarantee fund maintained by a clearing house or exchange as part of the resources available to cover any losses in the event of a member default. Alternatively, these obligations may also include a pro rata share of the residual losses after applying the guarantee fund. Additionally, certain clearing houses require the Firm as a member to pay a pro rata share of losses that may result from the clearing house's investment of guarantee fund contributions and initial margin, unrelated to and independent of the default of another member. Generally a payment would only be required should such losses exceed the resources of the clearing house or exchange that are contractually required to absorb the losses in the first instance. In certain cases, it is difficult to estimate the Firm's maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against the Firm that have not yet occurred. However, based on historical experience, management expects the risk of loss to the Firm to be remote. Where the Firm's maximum possible exposure can be estimated, the amount is disclosed in the table on page 284, in the Exchange & clearing house guarantees and commitments line.

Sponsored member repo program

The Firm acts as a sponsoring member to clear eligible overnight and term resale and repurchase agreements through the Government Securities Division of the Fixed Income Clearing Corporation ("FICC") on behalf of clients that become sponsored members under the FICC's rules. The Firm also guarantees to the FICC the prompt and full payment and performance of its sponsored member clients' respective obligations under the FICC's rules. The Firm minimizes its liability under these guarantees by obtaining a security interest in the cash or high-quality securities collateral that the clients place with the clearing house; therefore, the Firm expects the risk of loss to be remote. The Firm's maximum possible exposure, without taking into consideration the associated collateral, is included in the Exchange & clearing house guarantees and commitments line on page 284. Refer to Note 11 for additional information on credit risk mitigation practices on resale agreements and the types of collateral pledged under repurchase agreements.

Guarantees of subsidiaries

In the normal course of business, the Parent Company may provide counterparties with guarantees of certain of the trading and other obligations of its subsidiaries on a contract-by-contract basis, as negotiated with the Firm's

counterparties. The obligations of the subsidiaries are included on the Firm's Consolidated balance sheets or are reflected as off-balance sheet commitments; therefore, the Parent Company has not recognized a separate liability for these guarantees. The Firm believes that the occurrence of any event that would trigger payments by the Parent Company under these guarantees is remote.

The Parent Company has guaranteed certain long-term debt and structured notes of its subsidiaries, including JPMorgan Chase Financial Company LLC ("JPMFC"), a 100%-owned finance subsidiary. All securities issued by JPMFC are fully and unconditionally guaranteed by the Parent Company and no other subsidiary of the parent company guarantees these securities. These guarantees, which rank on a parity with the Firm's unsecured and unsubordinated indebtedness, are not included in the table on page 284 of this Note. Refer to Note 20 for additional information.

Note 29 – Pledged assets and collateral

Pledged assets

The Firm pledges financial assets that it owns to maintain potential borrowing capacity at discount windows with Federal Reserve banks, various other central banks and FHLBs. Additionally, the Firm pledges assets for other purposes, including to collateralize repurchase and other securities financing agreements, to cover short sales and to collateralize derivative contracts and deposits. Certain of these pledged assets may be sold or repledged or otherwise used by the secured parties and are parenthetically identified on the Consolidated balance sheets as assets pledged.

The following table presents the Firm's pledged assets.

December 31, (in billions)	2021	2020
Assets that may be sold or repledged or otherwise used by secured parties	\$ 126.3	\$ 166.6
Assets that may not be sold or repledged or otherwise used by secured parties	112.0	113.9
Assets pledged at Federal Reserve banks and FHLBs	476.4	455.3
Total pledged assets	\$ 714.7	\$ 735.8

Total pledged assets do not include assets of consolidated VIEs; these assets are used to settle the liabilities of those entities. Refer to Note 14 for additional information on assets and liabilities of consolidated VIEs. Refer to Note 11 for additional information on the Firm's securities financing activities. Refer to Note 20 for additional information on the Firm's long-term debt. The significant components of the Firm's pledged assets were as follows.

December 31, (in billions)	2021	2020
Investment securities	\$ 80.1	\$ 80.2
Loans	428.5	420.5
Trading assets and other	206.1	235.1
Total pledged assets	\$ 714.7	\$ 735.8

Collateral

The Firm accepts financial assets as collateral that it is permitted to sell or repledge, deliver or otherwise use. This collateral is generally obtained under resale and other securities financing agreements, prime brokerage-related held-for-investment customer receivables and derivative contracts. Collateral is generally used under repurchase and other securities financing agreements, to cover short sales, and to collateralize derivative contracts and deposits.

The following table presents the fair value of collateral accepted.

December 31, (in billions)	2021	2020
Collateral permitted to be sold or repledged, delivered, or otherwise used	\$ 1,471.3	\$ 1,451.7
Collateral sold, repledged, delivered or otherwise used	1,111.0	1,038.9

Note 30 – Litigation

Contingencies

As of December 31, 2021, the Firm and its subsidiaries and affiliates are defendants or respondents in numerous legal proceedings, including private, civil litigations, government investigations or regulatory enforcement matters. The litigations range from individual actions involving a single plaintiff to class action lawsuits with potentially millions of class members. Investigations and regulatory enforcement matters involve both formal and informal proceedings, by both governmental agencies and self-regulatory organizations. These legal proceedings are at varying stages of adjudication, arbitration or investigation, and involve each of the Firm's lines of business and several geographies and a wide variety of claims (including common law tort and contract claims and statutory antitrust, securities and consumer protection claims), some of which present novel legal theories.

The Firm believes the estimate of the aggregate range of reasonably possible losses, in excess of reserves established, for its legal proceedings is from \$0 to approximately \$1.5 billion at December 31, 2021. This estimated aggregate range of reasonably possible losses was based upon information available as of that date for those proceedings in which the Firm believes that an estimate of reasonably possible loss can be made. For certain matters, the Firm does not believe that such an estimate can be made, as of that date. The Firm's estimate of the aggregate range of reasonably possible losses involves significant judgment, given:

- the number, variety and varying stages of the proceedings, including the fact that many are in preliminary stages,
- the existence in many such proceedings of multiple defendants, including the Firm, whose share of liability (if any) has yet to be determined,
- the numerous yet-unresolved issues in many of the proceedings, including issues regarding class certification and the scope of many of the claims, and
- the attendant uncertainty of the various potential outcomes of such proceedings, including where the Firm has made assumptions concerning future rulings by the court or other adjudicator, or about the behavior or incentives of adverse parties or regulatory authorities, and those assumptions prove to be incorrect.

In addition, the outcome of a particular proceeding may be a result which the Firm did not take into account in its estimate because the Firm had deemed the likelihood of that outcome to be remote. Accordingly, the Firm's estimate of the aggregate range of reasonably possible losses will change from time to time, and actual losses may vary significantly.

Set forth below are descriptions of the Firm's material legal proceedings.

Amrapali. India's Enforcement Directorate ("ED") is investigating J.P.Morgan India Private Limited in connection with investments made in 2010 and 2012 by two offshore funds formerly managed by JPMorgan Chase entities into residential housing projects developed by the Amrapali Group ("Amrapali"). In 2017, numerous creditors filed civil claims against Amrapali, including petitions brought by home buyers relating to delays in delivering or failure to deliver residential units. The home buyers' petitions have been overseen by the Supreme Court of India and are ongoing. In August 2021, the ED issued an order fining J.P. Morgan India Private Limited approximately \$31.5 million. The Firm is appealing the order and the fine. Relatedly, in July 2019, the Supreme Court of India issued an order making preliminary findings that Amrapali and other parties, including unspecified JPMorgan Chase entities and the offshore funds that had invested in the projects, violated certain currency control and money laundering provisions, and ordering the ED to conduct a further inquiry under India's Prevention of Money Laundering Act ("PMLA") and Foreign Exchange Management Act ("FEMA"). In May 2020, the ED attached approximately \$25 million from J.P. Morgan India Private Limited in connection with the criminal PMLA investigation. The Firm is responding to and cooperating with the PMLA investigation.

Federal Republic of Nigeria Litigation. JPMorgan Chase Bank, N.A. operated an escrow and depository account for the Federal Government of Nigeria ("FGN") and two major international oil companies. The account held approximately \$1.1 billion in connection with a dispute among the clients over rights to an oil field. Following the settlement of the dispute, JPMorgan Chase Bank, N.A. paid out the monies in the account in 2011 and 2013 in accordance with directions received from its clients. In November 2017, the Federal Republic of Nigeria ("FRN") commenced a claim in the English High Court for approximately \$875 million in payments made out of the accounts. The FRN, claiming to be the same entity as the FGN, alleges that the payments were instructed as part of a complex fraud not involving JPMorgan Chase Bank, N.A., but that JPMorgan Chase Bank, N.A. was or should have been on notice that the payments may be fraudulent. JPMorgan Chase Bank, N.A. applied for summary judgment and was unsuccessful. The claim is ongoing and a trial commenced in February 2022.

Foreign Exchange Investigations and Litigation. The Firm previously reported settlements with certain government authorities relating to its foreign exchange ("FX") sales and trading activities and controls related to those activities. Among those resolutions, in May 2015, the Firm pleaded guilty to a single violation of federal antitrust law. The Department of Labor granted the Firm a five-year

exemption of disqualification that allows the Firm and its affiliates to continue to rely on the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act (“ERISA”) until January 2023. The Firm will need the Department of Labor to approve a further exemption to cover the remainder of the ten-year disqualification period following the antitrust plea. The only remaining FX-related governmental inquiry is a South Africa Competition Commission matter which is currently pending before the South Africa Competition Tribunal.

With respect to civil litigation matters, in August 2018, the United States District Court for the Southern District of New York granted final approval to the Firm’s settlement of a consolidated class action brought by U.S.-based plaintiffs, which principally alleged violations of federal antitrust laws based on an alleged conspiracy to manipulate foreign exchange rates and also sought damages on behalf of persons who transacted in FX futures and options on futures. Certain members of the settlement class filed requests to the Court to be excluded from the class, and certain of them filed a complaint against the Firm and other foreign exchange dealers in November 2018. A number of these actions remain pending. Further, a putative class action has been filed against the Firm and other foreign exchange dealers on behalf of certain consumers who purchased foreign currencies at allegedly inflated rates. Another putative class action was brought against the Firm and other foreign exchange dealers on behalf of purported indirect purchasers of FX instruments. In 2020, the Court approved a settlement by the Firm and 11 other defendants of that class action for a total of \$10 million. In addition, some FX-related individual and putative class actions based on similar alleged underlying conduct have been filed outside the U.S., including in the U.K., Israel, the Netherlands, Brazil and Australia.

Inquiries Concerning Preservation Requirements. In December 2021 certain of the Firm’s subsidiaries entered into resolutions with the U.S. Securities and Exchange Commission (“SEC”) and the U.S. Commodity Futures Trading Commission (“CFTC”) to resolve their respective civil investigations of compliance with records preservation requirements applicable to broker-dealer firms, swap dealers and futures commission merchants. The SEC and CFTC found that J.P. Morgan Securities LLC did not maintain copies of certain communications required to be maintained under their respective record keeping rules, where such communications were sent or received by employees over electronic messaging channels that had not been approved for employee use by the Firm. The CFTC resolution also included JPMorgan Chase Bank, N.A. and J.P. Morgan Securities plc as swap dealers. The SEC and CFTC also found related supervision failures. Under these resolutions, J.P. Morgan Securities LLC paid a \$125 million civil monetary penalty to the SEC, and J.P. Morgan Securities LLC, JPMorgan Chase Bank, N.A. and J.P. Morgan Securities plc paid a total \$75 million civil monetary penalty to the CFTC. The Firm continues to respond to requests for information

and other material from certain authorities concerning its compliance with records preservation requirements in connection with business communications sent over electronic messaging channels that have not been approved by the Firm. The Firm is cooperating with these inquiries.

Interchange Litigation. Groups of merchants and retail associations filed a series of class action complaints alleging that Visa and Mastercard, as well as certain banks, conspired to set the price of credit and debit card interchange fees and enacted related rules in violation of antitrust laws. In 2012, the parties initially settled the cases for a cash payment, a temporary reduction of credit card interchange, and modifications to certain credit card network rules. In 2017, after the approval of that settlement was reversed on appeal, the case was remanded to the United States District Court for the Eastern District of New York for further proceedings consistent with the appellate decision.

The original class action was divided into two separate actions, one seeking primarily monetary relief and the other seeking primarily injunctive relief. In September 2018, the parties to the monetary class action finalized an agreement which amends and supersedes the prior settlement agreement. Pursuant to this settlement, the defendants collectively contributed an additional \$900 million to the approximately \$5.3 billion previously held in escrow from the original settlement. In December 2019, the amended settlement agreement was approved by the District Court. Certain merchants appealed the District Court’s approval order, and those appeals are pending. Based on the percentage of merchants that opted out of the amended class settlement, \$700 million has been returned to the defendants from the settlement escrow in accordance with the settlement agreement. The injunctive class action continues separately, and in September 2021, the District Court granted plaintiffs’ motion for class certification in part, and denied the motion in part.

In addition, certain merchants have filed individual actions raising similar allegations against Visa and Mastercard, as well as against the Firm and other banks, and some of those actions remain pending.

LIBOR and Other Benchmark Rate Investigations and Litigation. JPMorgan Chase has responded to inquiries from various governmental agencies and entities around the world relating primarily to the British Bankers Association’s (“BBA”) London Interbank Offered Rate (“LIBOR”) for various currencies and the European Banking Federation’s Euro Interbank Offered Rate (“EURIBOR”). The Swiss Competition Commission’s investigation relating to EURIBOR, to which the Firm and other banks are subject, continues. In December 2016, the European Commission issued a decision against the Firm and other banks finding an infringement of European antitrust rules relating to EURIBOR. The Firm has filed an appeal of that decision with the European General Court, and that appeal is pending.

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In addition, the Firm has been named as a defendant along with other banks in various individual and putative class actions related to benchmark rates, including U.S. dollar LIBOR. In actions related to U.S. dollar LIBOR during the period that it was administered by the BBA, the Firm has obtained dismissal of certain actions and resolved certain other actions, and others are in various stages of litigation. The United States District Court for the Southern District of New York has granted class certification of antitrust claims related to bonds and interest rate swaps sold directly by the defendants, including the Firm. A consolidated putative class action related to the period that U.S. dollar LIBOR was administered by ICE Benchmark Administration has been dismissed. In addition, a group of individual plaintiffs filed a lawsuit asserting antitrust claims, alleging that the Firm and other defendants were engaged in an unlawful agreement to set U.S. dollar LIBOR and conspired to monopolize the market for LIBOR-based consumer loans and credit cards. Defendants moved to dismiss plaintiffs' complaint. In December 2021, the court denied plaintiffs' motions for a preliminary injunction seeking to enjoin defendants from setting U.S. dollar LIBOR and enforcing any financial instruments that rely on U.S. dollar LIBOR. The Firm's settlements of putative class actions related to Swiss franc LIBOR, the Singapore Interbank Offered Rate and the Singapore Swap Offer Rate, and the Australian Bank Bill Swap Reference Rate remain subject to court approval.

Metals and U.S. Treasuries Investigations and Litigation and Related Inquiries. The Firm previously reported that it and/or certain of its subsidiaries had entered into resolutions with the U.S. Department of Justice ("DOJ"), the U.S. Commodity Futures Trading Commission ("CFTC") and the U.S. Securities and Exchange Commission ("SEC"), which, collectively, resolved those agencies' respective investigations relating to historical trading practices by former employees in the precious metals and U.S. treasuries markets and related conduct from 2008 to 2016.

The Firm entered into a Deferred Prosecution Agreement ("DPA") with the DOJ in which it agreed to the filing of a criminal information charging JPMorgan Chase & Co. with two counts of wire fraud and agreed, along with JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC, to certain terms and obligations as set forth therein. Under the terms of the DPA, the criminal information will be dismissed after three years, provided that JPMorgan Chase & Co., JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC fully comply with all of their obligations.

Across the three resolutions with the DOJ, CFTC and SEC, JPMorgan Chase & Co., JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC agreed to pay a total monetary amount of approximately \$920 million. A portion of the total monetary amount includes victim compensation payments.

Several putative class action complaints have been filed in the United States District Court for the Southern District of

New York against the Firm and certain former employees, alleging a precious metals futures and options price manipulation scheme in violation of the Commodity Exchange Act. Some of the complaints also allege unjust enrichment and deceptive acts or practices under the General Business Law of the State of New York. The Court consolidated these putative class actions, and, in December 2021, the Court preliminarily approved a settlement among the parties. In addition, several putative class actions were filed in the United States District Courts for the Northern District of Illinois and Southern District of New York against the Firm, alleging manipulation of U.S. Treasury futures and options, and bringing claims under the Commodity Exchange Act. The actions in the Northern District of Illinois were transferred to the Southern District of New York. The Court consolidated these putative class actions, and, in December 2021, the Court preliminarily approved a settlement among the parties. In Canada, plaintiffs have moved to commence putative class action proceedings based on similar alleged underlying conduct related to precious metals.

In October 2020, two putative class action complaints were filed under the Securities Exchange Act of 1934 in the United States District Court for the Eastern District of New York against the Firm and certain individual defendants on behalf of shareholders who acquired shares during the putative class period alleging that certain SEC filings of the Firm were materially false or misleading in that they did not disclose certain information relating to the above-referenced investigations. The Court consolidated these putative class actions in January 2021. Plaintiffs filed their second amended complaint in May 2021, which additionally alleged that certain orders in precious metals futures contracts placed by precious metals futures traders during the putative class period were materially false and misleading. Defendants have moved to dismiss.

Securities Lending Antitrust Litigation. JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC, J.P. Morgan Prime, Inc., and J.P. Morgan Strategic Securities Lending Corp. are named as defendants in a putative class action filed in the United States District Court for the Southern District of New York. The complaint asserts violations of federal antitrust law and New York State common law in connection with an alleged conspiracy to prevent the emergence of anonymous exchange trading for securities lending transactions. Defendants' motion to dismiss the complaint was denied. Plaintiffs have moved to certify a class in this action, which defendants are opposing.

* * *

In addition to the various legal proceedings discussed above, JPMorgan Chase and its subsidiaries are named as defendants or are otherwise involved in a substantial number of other legal proceedings. The Firm believes it has meritorious defenses to the claims asserted against it in its currently outstanding legal proceedings and it intends to

defend itself vigorously. Additional legal proceedings may be initiated from time to time in the future.

The Firm has established reserves for several hundred of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, the Firm accrues for a litigation-related liability when it is probable that such a liability has been incurred and the amount of the loss can be reasonably estimated. The Firm evaluates its outstanding legal proceedings each quarter to assess its litigation reserves, and makes adjustments in such reserves, upward or downward, as appropriate, based on management's best judgment after consultation with counsel. The Firm's legal expense was \$426 million, \$1.1 billion and \$239 million for the years ended December 31, 2021, 2020 and 2019, respectively. There is no assurance that the Firm's litigation reserves will not need to be adjusted in the future.

In view of the inherent difficulty of predicting the outcome of legal proceedings, particularly where the claimants seek very large or indeterminate damages, or where the matters present novel legal theories, involve a large number of parties or are in early stages of discovery, the Firm cannot state with confidence what will be the eventual outcomes of the currently pending matters, the timing of their ultimate resolution or the eventual losses, fines, penalties or consequences related to those matters. JPMorgan Chase believes, based upon its current knowledge and after consultation with counsel, consideration of the material legal proceedings described above and after taking into account its current litigation reserves and its estimated aggregate range of possible losses, that the other legal proceedings currently pending against it should not have a material adverse effect on the Firm's consolidated financial condition. The Firm notes, however, that in light of the uncertainties involved in such proceedings, there is no assurance that the ultimate resolution of these matters will not significantly exceed the reserves it has currently accrued or that a matter will not have material reputational consequences. As a result, the outcome of a particular matter may be material to JPMorgan Chase's operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of JPMorgan Chase's income for that period.

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Note 31 – International operations

The following table presents income statement and balance sheet-related information for JPMorgan Chase by major international geographic area. The Firm defines international activities for purposes of this footnote presentation as business transactions that involve clients residing outside of the U.S., and the information presented below is based predominantly on the domicile of the client, the location from which the client relationship is managed, booking location or the location of the trading desk. However, many of the Firm's U.S. operations serve international businesses.

As the Firm's operations are highly integrated, estimates and subjective assumptions have been made to apportion revenue and expense between U.S. and international operations. These estimates and assumptions are consistent with the allocations used for the Firm's segment reporting as set forth in Note 32.

The Firm's long-lived assets for the periods presented are not considered by management to be significant in relation to total assets. The majority of the Firm's long-lived assets are located in the U.S.

As of or for the year ended December 31, (in millions)	Revenue ^(c)	Expense ^(d)	Income before income tax expense	Net income	Total assets
2021					
Europe/Middle East/Africa	\$ 16,561	\$ 10,833	\$ 5,728	\$ 4,202	\$ 517,904 ^(e)
Asia-Pacific	9,654	6,372	3,282	2,300	277,897
Latin America/Caribbean	2,756	1,589	1,167	878	61,657
Total international	28,971	18,794	10,177	7,380	857,458
North America ^(a)	92,678	43,293	49,385	40,954	2,886,109
Total	\$ 121,649	\$ 62,087	\$ 59,562	\$ 48,334	\$ 3,743,567
2020^(b)					
Europe/Middle East/Africa	\$ 16,566	\$ 10,987	\$ 5,579	\$ 3,868	\$ 530,687 ^(e)
Asia-Pacific	9,289	5,558	3,731	2,630	252,553
Latin America/Caribbean	2,740	1,590	1,150	837	61,980
Total international	28,595	18,135	10,460	7,335	845,220
North America ^(a)	91,356	66,001	25,355	21,796	2,539,537
Total	\$ 119,951	\$ 84,136	\$ 35,815	\$ 29,131	\$ 3,384,757
2019^(b)					
Europe/Middle East/Africa	\$ 15,887	\$ 9,860	\$ 6,027	\$ 4,158	\$ 391,369 ^(e)
Asia-Pacific	7,254	5,060	2,194	1,467	183,023
Latin America/Caribbean	2,405	1,561	844	609	47,820
Total international	25,546	16,481	9,065	6,234	622,212
North America ^(a)	90,174	54,373	35,801	30,197	2,064,265
Total	\$ 115,720	\$ 70,854	\$ 44,866	\$ 36,431	\$ 2,686,477

(a) Substantially reflects the U.S.

(b) Prior-period amounts have been revised to conform with the current presentation.

(c) Revenue is composed of net interest income and noninterest revenue.

(d) Expense is composed of noninterest expense and the provision for credit losses.

(e) Total assets for the U.K. were approximately \$365 billion, \$353 billion and \$309 billion at December 31, 2021, 2020 and 2019, respectively.

Note 32 – Business segments

The Firm is managed on an LOB basis. There are four major reportable business segments – Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management. In addition, there is a Corporate segment. The business segments are determined based on the products and services provided, or the type of customer served, and they reflect the manner in which financial information is evaluated by the Firm's Operating Committee. Segment results are presented on a managed basis. Refer to Segment results of this footnote for a further discussion of JPMorgan Chase's business segments.

The following is a description of each of the Firm's business segments, and the products and services they provide to their respective client bases.

Consumer & Community Banking

Consumer & Community Banking offers services to consumers and businesses through bank branches, ATMs, digital (including mobile and online) and telephone banking. CCB is organized into Consumer & Business Banking (including Consumer Banking, J.P. Morgan Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card & Auto. Consumer & Business Banking offers deposit, investment and lending products, payments and services to consumers, and lending, deposit, and cash management and payment solutions to small businesses. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card & Auto issues credit cards to consumers and small businesses and originates and services auto loans and leases.

Corporate & Investment Bank

The Corporate & Investment Bank, which consists of Banking and Markets & Securities Services, offers a broad suite of investment banking, market-making, prime brokerage, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, merchants, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Payments, which provides payments services enabling clients to manage payments and receipts globally, and cross-border financing. Markets & Securities Services includes Markets, a global market-maker across products, including cash and derivative instruments, which also offers sophisticated risk

management solutions, prime brokerage, and research. Markets & Securities Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Commercial Banking

Commercial Banking provides comprehensive financial solutions, including lending, payments, investment banking and asset management products across three primary client segments: Middle Market Banking, Corporate Client Banking and Commercial Real Estate Banking. Other includes amounts not aligned with a primary client segment.

Middle Market Banking covers small and midsized companies, local governments and nonprofit clients.

Corporate Client Banking covers large corporations.

Commercial Real Estate Banking covers investors, developers, and owners of multifamily, office, retail, industrial and affordable housing properties.

Asset & Wealth Management

Asset & Wealth Management, with client assets of \$4.3 trillion, is a global leader in investment and wealth management.

Asset Management

Offers multi-asset investment management solutions across equities, fixed income, alternatives and money market funds to institutional and retail investors providing for a broad range of clients' investment needs.

Global Private Bank

Provides retirement products and services, brokerage, custody, trusts and estates, loans, mortgages, deposits and investment management to high net worth clients.

The majority of AWM's client assets are in actively managed portfolios.

Corporate

The Corporate segment consists of Treasury and Chief Investment Office and Other Corporate, which includes corporate staff functions and expense that is centrally managed. Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The major Other Corporate functions include Real Estate, Technology, Legal, Corporate Finance, Human Resources, Internal Audit, Risk Management, Compliance, Control Management, Corporate Responsibility and various Other Corporate groups.

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Segment results

The following table provides a summary of the Firm's segment results as of or for the years ended December 31, 2021, 2020 and 2019, on a managed basis. The Firm's definition of managed basis starts with the reported U.S. GAAP results and includes certain reclassifications to present total net revenue for the Firm (and each of the reportable business segments) on an FTE basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in the managed results on a basis comparable to taxable investments and securities. This allows management to assess the comparability of revenue from year-to-year arising from both taxable and tax-exempt sources. The corresponding income tax impact related to tax-exempt items is recorded within income tax expense/(benefit). These adjustments have no impact on net income as reported by the Firm as a whole or by the LOBs.

Capital allocation

Each business segment is allocated capital by taking into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. ROE is measured and internal targets for expected returns are established as key measures of a business segment's performance.

The Firm's allocation methodology incorporates Basel III Standardized RWA, Basel III Advanced RWA, the GSIB surcharge, and a simulation of capital in a severe stress environment. The assumptions and methodologies used to allocate capital are periodically reassessed and as a result, the capital allocated to the LOBs may change from time to time.

Segment results and reconciliation^(a)

(Table continued on next page)

As of or for the year ended December 31, (in millions, except ratios)	Consumer & Community Banking			Corporate & Investment Bank			Commercial Banking			Asset & Wealth Management		
	2021	2020	2019	2021	2020	2019	2021	2020	2019	2021	2020	2019
Noninterest revenue	\$17,286	\$ 17,740	\$ 17,796	\$38,209	\$ 35,120	\$30,060	\$ 3,929	\$ 3,067	\$ 2,710	\$13,071	\$10,822	\$10,236
Net interest income	32,787	33,528	37,337	13,540	14,164	9,205	6,079	6,246	6,554	3,886	3,418	3,355
Total net revenue	50,073	51,268	55,133	51,749	49,284	39,265	10,008	9,313	9,264	16,957	14,240	13,591
Provision for credit losses	(6,989)	12,312	4,954	(1,174)	2,726	277	(947)	2,113	296	(227)	263	59
Noninterest expense	29,256	27,990	28,276	25,325	23,538	22,444	4,041	3,798	3,735	10,919	9,957	9,747
Income/(loss) before income tax expense/ (benefit)	27,806	10,966	21,903	27,598	23,020	16,544	6,914	3,402	5,233	6,265	4,020	3,785
Income tax expense/ (benefit)	6,876	2,749	5,362	6,464	5,926	4,590	1,668	824	1,275	1,528	1,028	918
Net income/(loss)	\$20,930	\$ 8,217	\$ 16,541	\$21,134	\$ 17,094	\$ 11,954	\$ 5,246	\$ 2,578	\$ 3,958	\$ 4,737	\$ 2,992	\$ 2,867
Average equity	\$50,000	\$ 52,000	\$ 52,000	\$83,000	\$ 80,000	\$ 80,000	\$24,000	\$22,000	\$22,000	\$14,000	\$10,500	\$10,500
Total assets	500,370	496,705	541,367	1,259,896	1,095,926 ^(b)	913,803 ^(b)	230,776	228,911	220,514	234,425	203,384	173,175
Return on equity	41 %	15 %	31 %	25 %	20 %	14 %	21 %	11 %	17 %	33 %	28 %	26 %
Overhead ratio	58	55	51	49	48	57	40	41	40	64	70	72

(Table continued from previous page)

As of or for the year ended December 31, (in millions, except ratios)	Corporate			Reconciling Items ^(a)			Total		
	2021	2020	2019	2021	2020	2019	2021	2020	2019
Noninterest revenue	\$ 68	\$ 1,199	\$ (114)	\$ (3,225)	\$ (2,560) ^(b)	\$ (2,213) ^(b)	\$ 69,338	\$ 65,388	\$ 58,475 ^(b)
Net interest income	(3,551)	(2,375)	1,325	(430)	(418)	(531)	52,311	54,563	57,245
Total net revenue	(3,483)	(1,176)	1,211	(3,655)	(2,978)	(2,744)	121,649	119,951	115,720
Provision for credit losses	81	66	(1)	–	–	–	(9,256)	17,480	5,585
Noninterest expense	1,802	1,373	1,067	–	–	–	71,343	66,656	65,269
Income/(loss) before income tax expense/(benefit)	(5,366)	(2,615)	145	(3,655)	(2,978)	(2,744)	59,562	35,815	44,866
Income tax expense/(benefit)	(1,653)	(865)	(966)	(3,655)	(2,978) ^(b)	(2,744) ^(b)	11,228	6,684	8,435 ^(b)
Net income/(loss)	\$ (3,713)	\$ (1,750)	\$ 1,111	\$ –	\$ –	\$ –	\$ 48,334	\$ 29,131	\$ 36,431
Average equity	\$ 79,968	\$ 72,365	\$ 68,407	\$ –	\$ –	\$ –	\$ 250,968	\$ 236,865	\$ 232,907
Total assets	1,518,100	1,359,831	837,618	NA	NA	NA	3,743,567	3,384,757	2,686,477 ^(b)
Return on equity	NM	NM	NM	NM	NM	NM	19 %	12 %	15 %
Overhead ratio	NM	NM	NM	NM	NM	NM	59	56	56 ^(b)

(a) Segment results on a managed basis reflect revenue on a FTE basis with the corresponding income tax impact recorded within income tax expense/(benefit). These adjustments are eliminated in reconciling items to arrive at the Firm's reported U.S. GAAP results.

(b) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Notes to consolidated financial statements

Note 33 – Parent Company

The following tables present Parent Company-only financial statements.

Statements of income and comprehensive income

Year ended December 31, (in millions)	2021	2020	2019
Income			
Dividends from subsidiaries and affiliates:			
Bank and bank holding company	\$ 10,000	\$ 6,000	\$ 26,000
Non-bank ^(a)	—	—	—
Interest income from subsidiaries	32	63	223
Other income/(expense) from subsidiaries:			
Bank and bank holding company	859	2,019	2,738
Non-bank	366	(569)	197
Other income/(expense)	1,137	205	(1,731)
Total income	12,394	7,718	27,427
Expense			
Interest expense/(income) to subsidiaries and affiliates ^(a)	5,353	(8,830)	(5,303)
Other interest expense/(income)	(1,349)	14,150	13,246
Noninterest expense	2,637	2,222	1,992
Total expense	6,641	7,542	9,935
Income before income tax benefit and undistributed net income of subsidiaries	5,753	176	17,492
Income tax benefit	1,329	1,324	2,033
Equity in undistributed net income of subsidiaries	41,252	27,631	16,906
Net income	\$ 48,334	\$ 29,131	\$ 36,431
Other comprehensive income/(loss), net	(8,070)	6,417	3,076
Comprehensive income	\$ 40,264	\$ 35,548	\$ 39,507

Balance sheets

December 31, (in millions)	2021	2020
Assets		
Cash and due from banks	\$ 36	\$ 54
Deposits with banking subsidiaries	6,809	6,811
Trading assets	2,293	1,775
Advances to, and receivables from, subsidiaries:		
Bank and bank holding company	431	27
Non-bank	50	86
Investments (at equity) in subsidiaries and affiliates:		
Bank and bank holding company	545,635	508,602
Non-bank	1,007	1,011
Other assets	12,220	10,058
Total assets	\$ 568,481	\$ 528,424
Liabilities and stockholders' equity		
Borrowings from, and payables to, subsidiaries and affiliates ^(a)	\$ 28,039	\$ 25,150
Short-term borrowings	1,018	924
Other liabilities	9,340	9,612
Long-term debt ^{(b)(c)}	235,957	213,384
Total liabilities^(c)	274,354	249,070
Total stockholders' equity	294,127	279,354
Total liabilities and stockholders' equity	\$ 568,481	\$ 528,424

Statements of cash flows

Year ended December 31, (in millions)	2021	2020	2019
Operating activities			
Net income	\$ 48,334	\$ 29,131	\$ 36,431
Less: Net income of subsidiaries and affiliates ^(a)	51,252	33,631	42,906
Parent company net loss	(2,918)	(4,500)	(6,475)
Cash dividends from subsidiaries and affiliates ^(a)	10,000	6,000	26,000
Other operating adjustments	(12,677)	15,357	9,862
Net cash provided by/(used in) operating activities	(5,595)	16,857	29,387
Investing activities			
Net change in:			
Advances to and investments in subsidiaries and affiliates, net	(3,000)	(2,663)	(6) ^(e)
All other investing activities, net	31	24	71
Net cash provided by/(used in) investing activities	(2,969)	(2,639)	65
Financing activities			
Net change in:			
Borrowings from subsidiaries and affiliates ^(a)	2,647	1,425	2,941
Short-term borrowings	—	(20)	(56)
Proceeds from long-term borrowings	49,169	37,312	25,569
Payments of long-term borrowings	(15,543)	(34,194)	(21,226)
Proceeds from issuance of preferred stock	7,350	4,500	5,000
Redemption of preferred stock	(2,575)	(1,430)	(4,075)
Treasury stock repurchased	(18,408)	(6,517)	(24,001)
Dividends paid	(12,858)	(12,690)	(12,343)
All other financing activities, net	(1,238)	(1,080)	(1,290)
Net cash provided by/(used in) financing activities	8,544	(12,694)	(29,481)
Net increase/(decrease) in cash and due from banks and deposits with banking subsidiaries	(20)	1,524	(29)
Cash and due from banks and deposits with banking subsidiaries at the beginning of the year	6,865	5,341	5,370
Cash and due from banks and deposits with banking subsidiaries at the end of the year	\$ 6,845	\$ 6,865	\$ 5,341
Cash interest paid	\$ 4,065	\$ 5,445	\$ 7,957
Cash income taxes paid, net ^(d)	15,259	5,366	3,910

- (a) Affiliates include trusts that issued guaranteed capital debt securities ("issuer trusts").
- (b) At December 31, 2021, long-term debt that contractually matures in 2022 through 2026 totaled \$10.7 billion, \$16.6 billion, \$24.2 billion, \$22.8 billion, and \$24.7 billion, respectively.
- (c) Refer to Notes 20 and 28 for information regarding the Parent Company's guarantees of its subsidiaries' obligations.
- (d) Represents payments, net of refunds, made by the Parent Company to various taxing authorities and includes taxes paid on behalf of certain of its subsidiaries that are subsequently reimbursed. The reimbursements were \$13.9 billion, \$8.3 billion, and \$6.4 billion for the years ended December 31, 2021, 2020, and 2019, respectively.
- (e) As a result of the merger of Chase Bank USA, N.A. with and into JPMorgan Chase Bank, N.A., JPMorgan Chase Bank, N.A. distributed \$13.5 billion to the Parent company as a return of capital, which the Parent company contributed to the IHC.

Supplementary information

Selected quarterly financial data (unaudited)

For the period ended (in millions)	2021				2020			
	4th quarter	3rd quarter	2nd quarter	1st quarter	4th quarter	3rd quarter	2nd quarter	1st quarter
Selected income statement data								
Total net revenue ^(a)	\$ 29,257	\$ 29,647	\$ 30,479	\$ 32,266	\$ 29,335	\$ 29,255	\$ 33,075	\$ 28,286
Total noninterest expense	17,888	17,063	17,667	18,725	16,048	16,875	16,942	16,791
Pre-provision profit^(b)	11,369	12,584	12,812	13,541	13,287	12,380	16,133	11,495
Provision for credit losses	(1,288)	(1,527)	(2,285)	(4,156)	(1,889)	611	10,473	8,285
Income before income tax expense	12,657	14,111	15,097	17,697	15,176	11,769	5,660	3,210
Income tax expense ^(a)	2,258	2,424	3,149	3,397	3,040	2,326	973	345
Net income	\$ 10,399	\$ 11,687	\$ 11,948	\$ 14,300	\$ 12,136	\$ 9,443	\$ 4,687	\$ 2,865

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

(b) Pre-provision profit is a non-GAAP financial measure. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60 for a discussion of these measures.

Distribution of assets, liabilities and stockholders' equity; interest rates and interest differentials

Consolidated average balance sheets, interest and rates

Provided below is a summary of JPMorgan Chase's consolidated average balances, interest and rates on a taxable-equivalent basis for the years 2019 through 2021. Income computed on a taxable-equivalent basis is the income reported in the Consolidated statements of income, adjusted to present interest income and rates earned on

assets exempt from income taxes (i.e., federal taxes) on a basis comparable with other taxable investments. The incremental tax rate used for calculating the taxable-equivalent adjustment was approximately 24% in 2021, 2020 and 2019.

(Table continued on next page)

(Unaudited)	2021		
Year ended December 31, (Taxable-equivalent interest and rates; in millions, except rates)	Average balance	Interest ^(h)	Rate
Assets			
Deposits with banks	\$ 719,772	\$ 512	0.07 %
Federal funds sold and securities purchased under resale agreements	269,231	958	0.36
Securities borrowed	190,655	(385)	(0.20) ⁽ⁱ⁾
Trading assets - debt instruments	283,829	6,856	2.42
Taxable securities	563,147	6,460	1.15
Non-taxable securities ^(a)	30,830	1,336	4.33
Total investment securities	593,977	7,796	1.31 ^(k)
Loans	1,035,399	41,663 ⁽ⁱ⁾	4.02
All other interest-earning assets ^(b)	123,079	894	0.73
Total interest-earning assets	3,215,942	58,294	1.81
Allowance for loan losses	(22,179)		
Cash and due from banks	26,776		
Trading assets - equity and other instruments	172,822		
Trading assets - derivative receivables	69,101		
Goodwill, MSRs and other intangible assets	55,003		
All other noninterest-earning assets ^(c)	207,737		
Total assets	\$ 3,725,202		
Liabilities			
Interest-bearing deposits	\$ 1,694,865	\$ 531	0.03 %
Federal funds purchased and securities loaned or sold under repurchase agreements	259,302	274	0.11
Short-term borrowings ^(d)	44,618	126	0.28
Trading liabilities - debt and all other interest-bearing liabilities ^{(e)(f)}	241,431	257	0.11 ⁽ⁱ⁾
Beneficial interests issued by consolidated VIEs	14,595	83	0.57
Long-term debt	250,378	4,282	1.71
Total interest-bearing liabilities	2,505,189	5,553	0.22
Noninterest-bearing deposits	652,289		
Trading liabilities - equity and other instruments ^(f)	36,656		
Trading liabilities - derivative payables	60,318		
All other liabilities, including the allowance for lending-related commitments ^(c)	186,755		
Total liabilities	3,441,207		
Stockholders' equity			
Preferred stock	33,027		
Common stockholders' equity	250,968		
Total stockholders' equity	283,995 ^(g)		
Total liabilities and stockholders' equity	\$ 3,725,202		
Interest rate spread			1.59 %
Net interest income and net yield on interest-earning assets		\$ 52,741	1.64

(a) Represents securities that are tax-exempt for U.S. federal income tax purposes.

(b) Includes brokerage-related held-for-investment customer receivables, which are classified in accrued interest and accounts receivable, and all other interest-earning assets, which are classified in other assets on the Consolidated Balance Sheets.

(c) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

(d) Includes commercial paper.

(e) All other interest-bearing liabilities include brokerage-related customer payables.

Within the Consolidated average balance sheets, interest and rates summary, the principal amounts of nonaccrual loans have been included in the average loan balances used to determine the average interest rate earned on loans. Refer to Note 12 for additional information on nonaccrual loans, including interest accrued.

(Table continued from previous page)

2020			2019		
Average balance	Interest ^(h)	Rate	Average balance	Interest ^(h)	Rate
\$ 444,058	\$ 749	0.17 %	\$ 280,004	\$ 3,887	1.39 %
275,926	2,436	0.88	275,429	6,146	2.23
143,472	(302)	(0.21) ⁽ⁱ⁾	131,291	1,574	1.20
322,936	7,869	2.44	294,958	9,189	3.12
476,650	7,843	1.65	284,127	7,962	2.80
33,287	1,437	4.32	35,748	1,655	4.63
509,937	9,280	1.82 ^(k)	319,875	9,617	3.01 ^(k)
1,004,597	43,886 ⁽ⁱ⁾	4.37	989,943	52,012 ⁽ⁱ⁾	5.25
78,784	1,023	1.30	53,779	2,146	3.99
2,779,710	64,941	2.34	2,345,279	84,571	3.61
(25,775)			(13,331)		
22,241			20,645		
120,878 ^(l)			114,323		
73,749 ^(l)			53,786		
51,934			53,683		
179,413			166,718		
\$ 3,202,150			\$ 2,741,103		
\$ 1,389,224	\$ 2,357	0.17 %	\$ 1,115,848	\$ 8,957	0.80 %
255,421	1,058	0.41	227,994	4,630	2.03
38,853	372	0.96	52,426	1,248	2.38
205,255	195	0.10 ⁽ⁱ⁾	182,105	2,585	1.42
19,216	214	1.12	22,501	568	2.52
254,400	5,764	2.27	247,968	8,807	3.55
2,162,369	9,960	0.46	1,848,842	26,795	1.45
517,527			407,219		
32,628			31,085		
61,593			42,560		
161,269			150,979		
2,935,386			2,480,685		
29,899			27,511		
236,865			232,907		
266,764 ^(g)			260,418 ^(g)		
\$ 3,202,150			\$ 2,741,103		
		1.88 %			2.16 %
	\$ 54,981	1.98		\$ 57,776	2.46

(f) The combined balance of trading liabilities - debt and equity instruments was \$128.2 billion, \$106.5 billion and \$101.0 billion for the years ended December 31, 2021, 2020 and 2019, respectively.

(g) The ratio of average stockholders' equity to average assets was 7.6%, 8.3% and 9.5% for the years ended December 31, 2021, 2020 and 2019, respectively. The return on average stockholders' equity, based on net income, was 17.0%, 10.9% and 14.0% for the years ended December 31, 2021, 2020 and 2019, respectively.

(h) Interest includes the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable.

(i) Fees and commissions on loans included in loan interest amounted to \$1.9 billion, \$1.0 billion and \$1.2 billion for the years ended December 31, 2021, 2020 and 2019.

(j) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.

(k) The annualized rate for securities based on amortized cost was 1.33%, 1.85% and 3.05% for the years ended December 31, 2021, 2020 and 2019, respectively, and does not give effect to changes in fair value that are reflected in AOCI.

(l) Prior-period amounts have been revised to conform with the current presentation.

Interest rates and interest differential analysis of net interest income - U.S. and non-U.S.

Presented below is a summary of interest and rates segregated between U.S. and non-U.S. operations for the years 2019 through 2021. The segregation of U.S. and non-U.S. components is based on the location of the office recording the transaction. Intercompany funding generally consists of dollar-denominated deposits originated in various locations that are centrally managed by Treasury and CIO.

(Table continued on next page)

(Unaudited) Year ended December 31, (Taxable-equivalent interest and rates; in millions, except rates)	2021		
	Average balance	Interest	Rate
Interest-earning assets			
Deposits with banks:			
U.S.	\$ 527,340	\$ 693	0.13 %
Non-U.S.	192,432	(181)	(0.09)
Federal funds sold and securities purchased under resale agreements:			
U.S.	114,406	299	0.26
Non-U.S.	154,825	659	0.43
Securities borrowed: ^(a)			
U.S.	137,752	(319)	(0.23)
Non-U.S.	52,903	(66)	(0.12)
Trading assets - debt instruments:			
U.S.	158,793	3,530	2.22
Non-U.S.	125,036	3,326	2.66
Investment securities:			
U.S.	563,109	7,399	1.31
Non-U.S.	30,868	397	1.29
Loans:			
U.S.	924,713	39,215	4.24
Non-U.S.	110,686	2,448	2.21
All other interest-earning assets, predominantly U.S.	123,079	894	0.73
Total interest-earning assets	3,215,942	58,294	1.81
Interest-bearing liabilities			
Interest-bearing deposits:			
U.S.	1,323,812	901	0.07
Non-U.S.	371,053	(370)	(0.10)
Federal funds purchased and securities loaned or sold under repurchase agreements:			
U.S.	199,220	222	0.11
Non-U.S.	60,082	52	0.09
Trading liabilities - debt, short-term and all other interest-bearing liabilities ^{(a)(b)}			
U.S.	176,466	(345)	(0.20)
Non-U.S.	109,583	728	0.66
Beneficial interests issued by consolidated VIEs, predominantly U.S.	14,595	83	0.57
Long-term debt:			
U.S.	244,850	4,229	1.73
Non-U.S.	5,528	53	0.96
Intercompany funding:			
U.S.	(116,317)	(1,229)	—
Non-U.S.	116,317	1,229	—
Total interest-bearing liabilities	2,505,189	5,553	0.22
Noninterest-bearing liabilities ^(c)	710,753		
Total investable funds	\$ 3,215,942	\$ 5,553	0.17 %
Net interest income and net yield:			
U.S.		\$ 46,622	1.86
Non-U.S.		6,119	0.87
Percentage of total assets and liabilities attributable to non-U.S. operations:			
Assets			24.6
Liabilities			20.4

(a) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.

(b) Includes commercial paper.

(c) Represents the amount of noninterest-bearing liabilities funding interest-earning assets.

Refer to the “Net interest income” discussion in Consolidated Results of Operations on pages 52-54 for further information.

(Table continued from previous page)

2020			2019		
Average balance	Interest	Rate	Average balance	Interest	Rate
\$ 294,669	\$ 768	0.26 %	\$ 165,066	\$ 3,588	2.17 %
149,389	(19)	(0.01)	114,938	299	0.26
141,409	1,341	0.95	150,205	4,068	2.71
134,517	1,095	0.81	125,224	2,078	1.66
100,026	(305)	(0.30)	92,625	1,423	1.54
43,446	3	0.01	38,666	151	0.39
216,025	5,056	2.34	200,811	6,157	3.07
106,911	2,813	2.63	94,147	3,032	3.22
475,832	8,703	1.83	287,961	8,963	3.11
34,105	577	1.69	31,914	654	2.05
909,850	41,708	4.58	898,570	49,058	5.46
94,747	2,178	2.30	91,373	2,954	3.23
78,784	1,023	1.30	53,779	2,146	3.99
2,779,710	64,941	2.34	2,345,279	84,571	3.61
1,068,857	2,288	0.21	850,493	6,896	0.81
320,367	69	0.02	265,355	2,061	0.78
204,958	863	0.42	164,284	3,989	2.43
50,463	195	0.39	63,710	641	1.01
151,120	(30)	(0.02)	147,247	2,574	1.75
92,988	597	0.64	87,284	1,259	1.44
19,216	214	1.12	22,501	568	2.52
247,623	5,704	2.30	241,914	8,766	3.62
6,777	60	0.89	6,054	41	0.68
(46,327)	(1,254)	—	(42,947)	(1,414)	—
46,327	1,254	—	42,947	1,414	—
2,162,369	9,960	0.46	1,848,842	26,795	1.45
617,341			496,437		
\$ 2,779,710	\$ 9,960	0.36 %	\$ 2,345,279	\$ 26,795	1.14 %
	\$ 54,981	1.98 %		\$ 57,776	2.46 %
	49,242	2.25		52,217	2.86
	5,739	0.97		5,559	1.07
		23.5			24.5
		20.9			22.1

Changes in net interest income, volume and rate analysis

The table below presents an attribution of net interest income between volume and rate. The attribution between volume and rate is calculated using annual average balances for each category of assets and liabilities shown in the table and the corresponding annual rates (refer to pages 300-304 for more information on average balances and rates). In this analysis, when the change cannot be isolated to either volume or rate, it has been allocated to volume. The annual rates include the impact of changes in market rates, as well as the impact of any change in composition of the various products within each category of asset or liability. This analysis is calculated separately for each category without consideration of the relationship between categories (for example, the net spread between the rates earned on assets and the rates paid on liabilities that fund those assets). As a result, changes in the granularity or groupings considered in this analysis would produce a different attribution result, and due to the complexities involved, precise allocation of changes in interest rates between volume and rates is inherently complex and judgmental.

(Unaudited) Year ended December 31, (On a taxable-equivalent basis; in millions)	2021 versus 2020			2020 versus 2019		
	Increase/(decrease) due to change in:		Net change	Increase/(decrease) due to change in:		Net change
	Volume	Rate		Volume	Rate	
Interest-earning assets						
Deposits with banks:						
U.S.	\$ 308	\$ (383)	\$ (75)	\$ 333	\$ (3,153)	\$ (2,820)
Non-U.S.	(42)	(120)	(162)	(8)	(310)	(318)
Federal funds sold and securities purchased under resale agreements:						
U.S.	(66)	(976)	(1,042)	(83)	(2,644)	(2,727)
Non-U.S.	75	(511)	(436)	81	(1,064)	(983)
Securities borrowed: ^(a)						
U.S.	(84)	70	(14)	(24)	(1,704)	(1,728)
Non-U.S.	(13)	(56)	(69)	(1)	(147)	(148)
Trading assets - debt instruments:						
U.S.	(1,267)	(259)	(1,526)	365	(1,466)	(1,101)
Non-U.S.	481	32	513	336	(555)	(219)
Investment securities:						
U.S.	1,170	(2,474)	(1,304)	3,426	(3,686)	(260)
Non-U.S.	(44)	(136)	(180)	38	(115)	(77)
Loans:						
U.S.	600	(3,093)	(2,493)	557	(7,907)	(7,350)
Non-U.S.	355	(85)	270	74	(850)	(776)
All other interest-earning assets, predominantly U.S.	320	(449)	(129)	324	(1,447)	(1,123)
Change in interest income	1,793	(8,440)	(6,647)	5,418	(25,048)	(19,630)
Interest-bearing liabilities						
Interest-bearing deposits:						
U.S.	109	(1,496)	(1,387)	495	(5,103)	(4,608)
Non-U.S.	(55)	(384)	(439)	25	(2,017)	(1,992)
Federal funds purchased and securities loaned or sold under repurchase agreements:						
U.S.	(6)	(635)	(641)	176	(3,302)	(3,126)
Non-U.S.	8	(151)	(143)	(51)	(395)	(446)
Trading liabilities - debt, short-term and all other interest-bearing liabilities ^{(a)(b)}						
U.S.	(43)	(272)	(315)	2	(2,606)	(2,604)
Non-U.S.	112	19	131	36	(698)	(662)
Beneficial interests issued by consolidated VIEs, predominantly U.S.	(27)	(104)	(131)	(37)	(317)	(354)
Long-term debt:						
U.S.	(64)	(1,411)	(1,475)	131	(3,193)	(3,062)
Non-U.S.	(12)	5	(7)	6	13	19
Intercompany funding:						
U.S.	(739)	764	25	(89)	249	160
Non-U.S.	739	(764)	(25)	89	(249)	(160)
Change in interest expense	22	(4,429)	(4,407)	783	(17,618)	(16,835)
Change in net interest income	\$ 1,771	\$ (4,011)	\$ (2,240)	\$ 4,635	\$ (7,430)	\$ (2,795)

(a) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.

(b) Includes commercial paper.

Glossary of Terms and Acronyms

2021 Form 10-K: Annual report on Form 10-K for the year ended December 31, 2021, filed with the U.S. Securities and Exchange Commission.

ABS: Asset-backed securities

AFS: Available-for-sale

ALCO: Asset Liability Committee

Amortized cost: Amount at which a financing receivable or investment is originated or acquired, adjusted for accretion or amortization of premium, discount, and net deferred fees or costs, collection of cash, charge-offs, foreign exchange, and fair value hedge accounting adjustments. For AFS securities, amortized cost is also reduced by any impairment losses recognized in earnings. Amortized cost is not reduced by the allowance for credit losses, except where explicitly presented net.

AOI: Accumulated other comprehensive income/(loss)

ARM: Adjustable rate mortgage(s)

AUC: Assets under custody

AUM: “Assets under management”: Represent assets managed by AWM on behalf of its Private Banking, Institutional and Retail clients. Includes “Committed capital not Called.”

Auto loan and lease origination volume: Dollar amount of auto loans and leases originated.

AWM: Asset & Wealth Management

Beneficial interests issued by consolidated VIEs: Represents the interest of third-party holders of debt, equity securities, or other obligations, issued by VIEs that JPMorgan Chase consolidates.

Benefit obligation: Refers to the projected benefit obligation for pension plans and the accumulated postretirement benefit obligation for OPEB plans.

BHC: Bank holding company

CB: Commercial Banking

CBB: Consumer & Business Banking

CCAR: Comprehensive Capital Analysis and Review

CCB: Consumer & Community Banking

CCO: Chief Compliance Officer

CCP: “Central counterparty” is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes a counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement.

CDS: Credit default swaps

CECL: Current Expected Credit Losses

CEO: Chief Executive Officer

CET1 Capital: Common equity Tier 1 capital

CFO: Chief Financial Officer

CFP: Contingency funding plan

CFTC: Commodity Futures Trading Commission

Chase Bank USA, N.A.: Chase Bank USA, National Association

CIB: Corporate & Investment Bank

CIO: Chief Investment Office

Client assets: Represent assets under management as well as custody, brokerage, administration and deposit accounts.

Client deposits and other third-party liabilities: Deposits, as well as deposits that are swept to on-balance sheet liabilities (e.g., commercial paper, federal funds purchased and securities loaned or sold under repurchase agreements) as part of client cash management programs.

CLO: Collateralized loan obligations

CLTV: Combined loan-to-value

CMT: Constant Maturity Treasury

Collateral-dependent: A loan is considered to be collateral-dependent when repayment of the loan is expected to be provided substantially through the operation or sale of the collateral when the borrower is experiencing financial difficulty, including when foreclosure is deemed probable based on borrower delinquency.

Commercial Card: provides a wide range of payment services to corporate and public sector clients worldwide through the commercial card products. Services include procurement, corporate travel and entertainment, expense management services, and business-to-business payment solutions.

Credit derivatives: Financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Upon the occurrence of a credit event by the reference entity, which may include, among other events, the bankruptcy or failure to pay its obligations, or certain restructurings of the debt of the reference entity, neither party has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value at the time of settling the credit derivative contract. The determination as to whether a credit event has occurred is generally made by the relevant International Swaps and Derivatives Association (“ISDA”) Determinations Committee.

Criticized: Criticized loans, lending-related commitments and derivative receivables that are classified as special

Glossary of Terms and Acronyms

mention, substandard and doubtful categories for regulatory purposes.

CRO: Chief Risk Officer

CTC: CIO, Treasury and Corporate

Custom lending: Loans to AWM's Global Private Bank clients, including loans to private investment funds and loans that are collateralized by nontraditional asset types, such as art work, aircraft, etc.

CVA: Credit valuation adjustment

Debit and credit card sales volume: Dollar amount of card member purchases, net of returns.

Deposit margin/deposit spread: Represents net interest income expressed as a percentage of average deposits.

Distributed denial-of-service attack: The use of a large number of remote computer systems to electronically send a high volume of traffic to a target website to create a service outage at the target. This is a form of cyberattack.

Dodd-Frank Act: Wall Street Reform and Consumer Protection Act

DVA: Debit valuation adjustment

EC: European Commission

Eligible HQLA: Eligible high-quality liquid assets, for purposes of calculating the LCR, is the amount of unencumbered HQLA that satisfy certain operational considerations as defined in the LCR rule.

Eligible LTD: Long-term debt satisfying certain eligibility criteria

Embedded derivatives: are implicit or explicit terms or features of a financial instrument that affect some or all of the cash flows or the value of the instrument in a manner similar to a derivative. An instrument containing such terms or features is referred to as a "hybrid." The component of the hybrid that is the non-derivative instrument is referred to as the "host." For example, callable debt is a hybrid instrument that contains a plain vanilla debt instrument (i.e., the host) and an embedded option that allows the issuer to redeem the debt issue at a specified date for a specified amount (i.e., the embedded derivative). However, a floating rate instrument is not a hybrid composed of a fixed-rate instrument and an interest rate swap.

EPS: Earnings per share

ERISA: Employee Retirement Income Security Act of 1974

ETD: "Exchange-traded derivatives": Derivative contracts that are executed on an exchange and settled via a central clearing house.

EU: European Union

Expense categories:

- Volume- and/or revenue-related expenses generally correlate with changes in the related business/

transaction volume or revenue. Examples include commissions and incentive compensation within the LOBs, depreciation expense related to operating lease assets, and brokerage expense related to trading transaction volume.

- Investments in the business include expenses associated with supporting medium- to longer-term strategic plans of the Firm. Examples include front office growth, market expansion, initiatives in technology (including related compensation), marketing, and acquisitions.
- Structural expenses are those associated with the day-to-day cost of running the Firm and are expenses not included in the above two categories. Examples include employee salaries and benefits, certain other incentive compensation, and costs related to real estate.

Fannie Mae: Federal National Mortgage Association

FASB: Financial Accounting Standards Board

FCA: Financial Conduct Authority

FCC: Firmwide Control Committee

FDIC: Federal Deposit Insurance Corporation

Federal Reserve: The Board of the Governors of the Federal Reserve System

FFIEC: Federal Financial Institutions Examination Council

FHA: Federal Housing Administration

FHLB: Federal Home Loan Bank

FICC: The Fixed Income Clearing Corporation

FICO score: A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the credit bureaus.

FINRA: Financial Industry Regulatory Authority

Firm: JPMorgan Chase & Co.

Forward points: Represents the interest rate differential between two currencies, which is either added to or subtracted from the current exchange rate (i.e., "spot rate") to determine the forward exchange rate.

FRC: Firmwide Risk Committee

Freddie Mac: Federal Home Loan Mortgage Corporation

Free standing derivatives: a derivative contract entered into either separate and apart from any of the Firm's other financial instruments or equity transactions. Or, in conjunction with some other transaction and is legally detachable and separately exercisable.

FSB: Financial Stability Board

FTE: Fully taxable equivalent

FVA: Funding valuation adjustment

FX: Foreign exchange

Glossary of Terms and Acronyms

G7: Group of Seven nations: Countries in the G7 are Canada, France, Germany, Italy, Japan, the U.K. and the U.S.

G7 government bonds: Bonds issued by the government of one of the G7 nations.

Ginnie Mae: Government National Mortgage Association

GSIB: Global systemically important banks

HELOC: Home equity line of credit

Home equity – senior lien: Represents loans and commitments where JPMorgan Chase holds the first security interest on the property.

Home equity – junior lien: Represents loans and commitments where JPMorgan Chase holds a security interest that is subordinate in rank to other liens.

Households: A household is a collection of individuals or entities aggregated together by name, address, tax identifier and phone number.

HQLA: “High-quality liquid assets” consist of cash and certain high-quality liquid securities as defined in the LCR rule.

HTM: Held-to-maturity

IBOR: Interbank Offered Rate

ICAAP: Internal capital adequacy assessment process

IDI: Insured depository institutions

IHC: JPMorgan Chase Holdings LLC, an intermediate holding company

Investment-grade: An indication of credit quality based on JPMorgan Chase’s internal risk assessment. The Firm considers ratings of BBB-/Baa3 or higher as investment-grade.

IPO: Initial public offering

ISDA: International Swaps and Derivatives Association

JPMorgan Chase: JPMorgan Chase & Co.

JPMorgan Chase Bank, N.A.: JPMorgan Chase Bank, National Association

JPMorgan Chase Foundation or the Firm’s Foundation: A not-for-profit organization that makes contributions for charitable and educational purposes.

JPMorgan Securities: J.P. Morgan Securities LLC

LCR: Liquidity coverage ratio

LDA: Loss Distribution Approach

LGD: Loss given default

LIBOR: London Interbank Offered Rate

LLC: Limited Liability Company

LOB: Line of business

LOB CROs: Line of Business and CTC Chief Risk Officers

LTIP: Long-term incentive plan

LTV: “Loan-to-value”: For residential real estate loans, the relationship, expressed as a percentage, between the principal amount of a loan and the appraised value of the collateral (i.e., residential real estate) securing the loan.

Origination date LTV ratio

The LTV ratio at the origination date of the loan. Origination date LTV ratios are calculated based on the actual appraised values of collateral (i.e., loan-level data) at the origination date.

Current estimated LTV ratio

An estimate of the LTV as of a certain date. The current estimated LTV ratios are calculated using estimated collateral values derived from a nationally recognized home price index measured at the metropolitan statistical area (“MSA”) level. These MSA-level home price indices consist of actual data to the extent available and forecasted data where actual data is not available. As a result, the estimated collateral values used to calculate these ratios do not represent actual appraised loan-level collateral values; as such, the resulting LTV ratios are necessarily imprecise and should therefore be viewed as estimates.

Combined LTV ratio

The LTV ratio considering all available lien positions, as well as unused lines, related to the property. Combined LTV ratios are used for junior lien home equity products.

Managed basis: A non-GAAP presentation of Firmwide financial results that includes reclassifications to present revenue on a fully taxable-equivalent basis. Management also uses this financial measure at the segment level, because it believes this provides information to enable investors to understand the underlying operational performance and trends of the particular business segment and facilitates a comparison of the business segment with the performance of competitors.

Master netting agreement: A single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due).

MBS: Mortgage-backed securities

MD&A: Management’s discussion and analysis

Measurement alternative: Measures equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer.

Merchant Services: offers merchants payment processing capabilities, fraud and risk management, data and analytics, and other payments services. Through Merchant Services, merchants of all sizes can accept payments via credit and debit cards and payments in multiple currencies.

Glossary of Terms and Acronyms

MEV: Macroeconomic variable

MLLF: Money Market Mutual Fund Liquidity Facility

Moody's: Moody's Investor Services

Mortgage origination channels:

Retail – Borrowers who buy or refinance a home through direct contact with a mortgage banker employed by the Firm using a branch office, the Internet or by phone. Borrowers are frequently referred to a mortgage banker by a banker in a Chase branch, real estate brokers, home builders or other third parties.

Correspondent – Banks, thrifts, other mortgage banks and other financial institutions that sell closed loans to the Firm.

Mortgage product types:

Alt-A

Alt-A loans are generally higher in credit quality than subprime loans but have characteristics that would disqualify the borrower from a traditional prime loan. Alt-A lending characteristics may include one or more of the following: (i) limited documentation; (ii) a high CLTV ratio; (iii) loans secured by non-owner occupied properties; or (iv) a debt-to-income ratio above normal limits. A substantial proportion of the Firm's Alt-A loans are those where a borrower does not provide complete documentation of his or her assets or the amount or source of his or her income.

Option ARMs

The option ARM real estate loan product is an adjustable-rate mortgage loan that provides the borrower with the option each month to make a fully amortizing, interest-only or minimum payment. The minimum payment on an option ARM loan is based on the interest rate charged during the introductory period. This introductory rate is usually significantly below the fully indexed rate. The fully indexed rate is calculated using an index rate plus a margin. Once the introductory period ends, the contractual interest rate charged on the loan increases to the fully indexed rate and adjusts monthly to reflect movements in the index. The minimum payment is typically insufficient to cover interest accrued in the prior month, and any unpaid interest is deferred and added to the principal balance of the loan. Option ARM loans are subject to payment recast, which converts the loan to a variable-rate fully amortizing loan upon meeting specified loan balance and anniversary date triggers.

Prime

Prime mortgage loans are made to borrowers with good credit records who meet specific underwriting requirements, including prescriptive requirements related to income and overall debt levels. New prime mortgage borrowers provide full documentation and generally have reliable payment histories.

Subprime

Subprime loans are loans that, prior to mid-2008, were offered to certain customers with one or more high risk characteristics, including but not limited to: (i) unreliable or

poor payment histories; (ii) a high LTV ratio of greater than 80% (without borrower-paid mortgage insurance); (iii) a high debt-to-income ratio; (iv) an occupancy type for the loan is other than the borrower's primary residence; or (v) a history of delinquencies or late payments on the loan.

MSA: Metropolitan statistical areas

MSR: Mortgage servicing rights

Multi-asset: Any fund or account that allocates assets under management to more than one asset class.

NA: Data is not applicable or available for the period presented.

NAV: Net Asset Value

Net Capital Rule: Rule 15c3-1 under the Securities Exchange Act of 1934.

Net charge-off/(recovery) rate: Represents net charge-offs/(recoveries) (annualized) divided by average retained loans for the reporting period.

Net interchange income includes the following components:

- **Interchange income:** Fees earned by credit and debit card issuers on sales transactions.
- **Reward costs:** The cost to the Firm for points earned by cardholders enrolled in credit card rewards programs generally tied to sales transactions.
- **Partner payments:** Payments to co-brand credit card partners based on the cost of loyalty program rewards earned by cardholders on credit card transactions.

Net mortgage servicing revenue: Includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

Net revenue rate: Represents Credit Card net revenue (annualized) expressed as a percentage of average loans for the period.

Net yield on interest-earning assets: The average rate for interest-earning assets less the average rate paid for all sources of funds.

NFA: National Futures Association

NM: Not meaningful

NOL: Net operating loss

Nonaccrual loans: Loans for which interest income is not recognized on an accrual basis. Loans (other than credit card loans and certain consumer loans insured by U.S.

Glossary of Terms and Acronyms

government agencies) are placed on nonaccrual status when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest have been in default for a period of 90 days or more unless the loan is both well-secured and in the process of collection. Collateral-dependent loans are typically maintained on nonaccrual status.

Nonperforming assets: Nonperforming assets include nonaccrual loans, nonperforming derivatives and certain assets acquired in loan satisfaction, predominantly real estate owned and other commercial and personal property.

NOW: Negotiable Order of Withdrawal

NSFR: Net Stable Funding Ratio

OAS: Option-adjusted spread

OCC: Office of the Comptroller of the Currency

OCI: Other comprehensive income/(loss)

OPEB: Other postretirement employee benefit

Over-the-counter (“OTC”) derivatives: Derivative contracts that are negotiated, executed and settled bilaterally between two derivative counterparties, where one or both counterparties is a derivatives dealer.

Over-the-counter cleared (“OTC-cleared”) derivatives: Derivative contracts that are negotiated and executed bilaterally, but subsequently settled via a central clearing house, such that each derivative counterparty is only exposed to the default of that clearing house.

Overhead ratio: Noninterest expense as a percentage of total net revenue.

Parent Company: JPMorgan Chase & Co.

Participating securities: Represents unvested share-based compensation awards containing nonforfeitable rights to dividends or dividend equivalents (collectively, “dividends”), which are included in the earnings per share calculation using the two-class method. JPMorgan Chase grants RSUs to certain employees under its share-based compensation programs, which entitle the recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to the dividends paid to holders of common stock. These unvested awards meet the definition of participating securities. Under the two-class method, all earnings (distributed and undistributed) are allocated to each class of common stock and participating securities, based on their respective rights to receive dividends.

PCA: Prompt corrective action

PCAOB: Public Company Accounting Oversight Board

PCD: “Purchased credit deteriorated” assets represent acquired financial assets that as of the date of acquisition have experienced a more-than-insignificant deterioration in credit quality since origination, as determined by the Firm.

PD: Probability of default

PPP: Paycheck Protection Program under the Small Business Association (“SBA”)

PRA: Prudential Regulation Authority

Pre-provision profit/(loss): Represents total net revenue less noninterest expense. The Firm believes that this financial measure is useful in assessing the ability of a lending institution to generate income in excess of its provision for credit losses.

Pre-tax margin: Represents income before income tax expense divided by total net revenue, which is, in management’s view, a comprehensive measure of pretax performance derived by measuring earnings after all costs are taken into consideration. It is one basis upon which management evaluates the performance of AWM against the performance of their respective competitors.

Principal transactions revenue: Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities, and on private equity investments.
 - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
 - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Firm transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk.

Production revenue: Includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option.

Glossary of Terms and Acronyms

PSUs: Performance share units

Regulatory VaR: Daily aggregated VaR calculated in accordance with regulatory rules.

REO: Real estate owned

Reported basis: Financial statements prepared under U.S. GAAP, which excludes the impact of taxable-equivalent adjustments.

Retained loans: Loans that are held-for-investment (i.e., excludes loans held-for-sale and loans at fair value).

Revenue wallet: Proportion of fee revenue based on estimates of investment banking fees generated across the industry (i.e., the revenue wallet) from investment banking transactions in M&A, equity and debt underwriting, and loan syndications. Source: Dealogic, a third-party provider of investment banking competitive analysis and volume-based league tables for the above noted industry products.

RHS: Rural Housing Service of the U.S. Department of Agriculture

ROA: Return on assets

ROE: Return on equity

ROTCE: Return on tangible common equity

ROU assets: Right-of-use assets

RSU(s): Restricted stock units

RWA: "Risk-weighted assets": Basel III establishes two comprehensive approaches for calculating RWA (a Standardized approach and an Advanced approach) which include capital requirements for credit risk, market risk, and in the case of Basel III Advanced, also operational risk. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced.

S&P: Standard and Poor's 500 Index

SA-CCR: Standardized Approach for Counterparty Credit Risk

SAR as it pertains to Hong Kong: Special Administrative Region

SAR(s) as it pertains to employee stock awards: Stock appreciation rights

SCB: Stress Capital Buffer

Scored portfolios: Consumer loan portfolios that predominantly include residential real estate loans, credit

card loans, auto loans to individuals and certain small business loans.

SEC: Securities and Exchange Commission

Securities financing agreements: Include resale, repurchase, securities borrowed and securities loaned agreements

Seed capital: Initial JPMorgan capital invested in products, such as mutual funds, with the intention of ensuring the fund is of sufficient size to represent a viable offering to clients, enabling pricing of its shares, and allowing the manager to develop a track record. After these goals are achieved, the intent is to remove the Firm's capital from the investment.

Shelf securities: Securities registered with the SEC under a shelf registration statement that have not been issued, offered or sold. These securities are not included in league tables until they have actually been issued.

Single-name: Single reference-entities

SLR: Supplementary leverage ratio

SMBS: Stripped mortgage-backed securities

SOFR: Secured Overnight Financing Rate

SPES: Special purpose entities

Structural interest rate risk: Represents interest rate risk of the non-trading assets and liabilities of the Firm.

Structured notes: Structured notes are financial instruments whose cash flows are linked to the movement in one or more indexes, interest rates, foreign exchange rates, commodities prices, prepayment rates, underlying reference pool of loans or other market variables. The notes typically contain embedded (but not separable or detachable) derivatives. Contractual cash flows for principal, interest, or both can vary in amount and timing throughout the life of the note based on non-traditional indexes or non-traditional uses of traditional interest rates or indexes.

Taxable-equivalent basis: In presenting results on a managed basis, the total net revenue for each of the business segments and the Firm is presented on a tax-equivalent basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in managed basis results on a level comparable to taxable investments and securities; the corresponding income tax impact related to tax-exempt items is recorded within income tax expense.

TBVPs: Tangible book value per share

TCE: Tangible common equity

TDR: "Troubled debt restructuring" is deemed to occur when the Firm modifies the original terms of a loan agreement by granting a concession to a borrower that is experiencing financial difficulty. Loans with short-term and

Glossary of Terms and Acronyms

other insignificant modifications that are not considered concessions are not TDRs.

TLAC: Total loss-absorbing capacity

U.K.: United Kingdom

U.S.: United States of America

U.S. GAAP: Accounting principles generally accepted in the U.S.

U.S. government agencies: U.S. government agencies include, but are not limited to, agencies such as Ginnie Mae and FHA, and do not include Fannie Mae and Freddie Mac which are U.S. government-sponsored enterprises (“U.S. GSEs”). In general, obligations of U.S. government agencies are fully and explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government in the event of a default.

U.S. GSE(s): “U.S. government-sponsored enterprises” are quasi-governmental, privately-held entities established or chartered by the U.S. government to serve public purposes as specified by the U.S. Congress to improve the flow of credit to specific sectors of the economy and provide certain essential services to the public. U.S. GSEs include Fannie Mae and Freddie Mac, but do not include Ginnie Mae or FHA. U.S. GSE obligations are not explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government.

U.S. Treasury: U.S. Department of the Treasury

VA: U.S. Department of Veterans Affairs

VaR: “Value-at-risk” is a measure of the dollar amount of potential loss from adverse market moves in an ordinary market environment.

VCG: Valuation Control Group

VGF: Valuation Governance Forum

VIes: Variable interest entities

Warehouse loans: Consist of prime mortgages originated with the intent to sell that are accounted for at fair value and classified as loans.

Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on behalf of the undersigned, thereunto duly authorized.

JPMorgan Chase & Co.
(Registrant)

By: /s/ JAMES DIMON

(James Dimon
Chairman and Chief Executive Officer)

February 22, 2022

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacity and on the date indicated. JPMorgan Chase & Co. does not exercise the power of attorney to sign on behalf of any Director.

	Capacity	Date
<u>/s/ JAMES DIMON</u> (James Dimon)	Director, Chairman and Chief Executive Officer (Principal Executive Officer)	
<u>/s/ LINDA B. BAMMANN</u> (Linda B. Bammann)	Director	
<u>/s/ STEPHEN B. BURKE</u> (Stephen B. Burke)	Director	
<u>/s/ TODD A. COMBS</u> (Todd A. Combs)	Director	
<u>/s/ JAMES S. CROWN</u> (James S. Crown)	Director	February 22, 2022
<u>/s/ TIMOTHY P. FLYNN</u> (Timothy P. Flynn)	Director	
<u>/s/ MELLODY HOBSON</u> (Mellody Hobson)	Director	
<u>/s/ MICHAEL A. NEAL</u> (Michael A. Neal)	Director	
<u>/s/ PHEBE N. NOVAKOVIC</u> (Phebe N. Novakovic)	Director	
<u>/s/ VIRGINIA M. ROMETTY</u> (Virginia M. Rometty)	Director	
<u>/s/ JEREMY BARNUM</u> (Jeremy Barnum)	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	
<u>/s/ ELENA KORABLINA</u> (Elena Korablina)	Managing Director and Firmwide Controller (Principal Accounting Officer)	

Exhibit 4.6

DESCRIPTION OF SECURITIES OF JPMORGAN CHASE & CO. REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

As of the filing date of the Annual Report on Form 10-K to which this Exhibit is attached (the “Form 10-K”), the following outstanding securities issued by JPMorgan Chase & Co. are registered pursuant to Section 12 of the Securities Exchange Act of 1934: (i) common stock; (ii) six series of preferred stock represented by depositary shares; (iii) the Alerian MLP Index ETN due May 24, 2024; and (iv) JPMorgan Chase & Co.’s guarantee of the Callable Fixed Rate Notes due June 10, 2032 issued by JPMorgan Chase Financial Company LLC. All references herein to “JPMorgan Chase,” “we” or “us” are to JPMorgan Chase & Co.

DESCRIPTION OF COMMON STOCK

The following summary is not complete. You should refer to the applicable provisions of our Restated Certificate of Incorporation and our By-laws, each of which are incorporated by reference as Exhibits to the Form 10-K, and to the Delaware General Corporation Law (“DGCL”), for a complete statement of the terms and rights of our common stock, par value \$1.00 per share, which we refer to herein as common stock. We encourage you to read our Restated Certificate of Incorporation, which we refer to herein as our certificate of incorporation, By-laws and the relevant provisions of the DGCL for additional information.

Authorized Shares

We are authorized to issue up to 9,000,000,000 shares of common stock.

Dividends

Holders of common stock are entitled to receive dividends if, as and when declared by our board of directors out of funds legally available for payment, subject to the rights of holders of our preferred stock.

Voting Rights

Each holder of common stock is entitled to one vote per share. Subject to the rights, if any, of the holders of any series of preferred stock under its applicable certificate of designations and applicable law, all voting rights are vested in the holders of shares of our common stock. Holders of shares of our common stock have noncumulative voting rights, which means that the holders of more than 50% of the shares voting for the election of directors can elect 100% of the directors and the holders of the remaining shares will not be able to elect any directors.

Rights Upon Liquidation

In the event of our voluntary or involuntary liquidation, dissolution or winding-up, the holders of our common stock will be entitled to share equally in any of our assets available for distribution after we have paid in full all of our debts and after the holders of all series of our outstanding preferred stock have received their liquidation preferences in full.

Miscellaneous

The issued and outstanding shares of common stock are fully paid and nonassessable. Holders of shares of our common stock are not entitled to preemptive rights or to the benefit of any sinking funds. Our common stock is not convertible into shares of any other class of our capital stock. Computershare Inc. is the transfer agent, registrar and dividend disbursement agent for our common stock.

Listing

Our common stock is listed on the New York Stock Exchange (“NYSE”) under the trading symbol “JPM”.

DESCRIPTION OF LISTED PREFERRED STOCK

The following summary is not complete. You should refer to our certificate of incorporation and to the Certificate of Designations, Powers, Preferences and Rights relating to each series of Listed Preferred Stock (as defined below), which we refer to herein as a certificate of designations, for the complete terms of that series of preferred stock. Copies of our certificate of incorporation and the certificate of designations for each series of Listed Preferred Stock are incorporated by reference as Exhibits to the Form 10-K. We encourage you to read our certificate of incorporation and the relevant certificates of designations for additional information.

Authorized Shares

Under our certificate of incorporation, our board of directors is authorized, without further stockholder action, to issue up to 200,000,000 shares of preferred stock, \$1 par value per share, which we refer to herein as preferred stock, in one or more series, and to determine the voting powers and the designations, preferences and relative, participating, optional or other special rights, and

qualifications, limitations or restrictions of each series. We may amend our certificate of incorporation to increase or decrease the number of authorized shares of preferred stock in a manner permitted by our certificate of incorporation and the DGCL.

Outstanding Preferred Stock

As of the filing date of the Form 10-K, we have 18 series of preferred stock issued and outstanding. The shares of each series of our preferred stock are represented by depositary shares, with each depositary share representing a fractional interest in a share of preferred stock of the relevant series. Of the 18 series of our issued and outstanding preferred stock, depositary shares representing the following six series of preferred stock are registered pursuant to Section 12 of the Securities Exchange Act of 1934, with each depositary share representing a 1/400th interest in a share of preferred stock of the relevant series:

- 5.75% Non-Cumulative Preferred Stock, Series DD;
- 6.00% Non-Cumulative Preferred Stock, Series EE;
- 4.75 Non-Cumulative Preferred Stock, Series GG;
- 4.55% Non-Cumulative Preferred Stock, Series JJ;
- 4.625% Non-Cumulative Preferred Stock, Series LL; and
- 4.20% Non-Cumulative Preferred Stock, Series MM.

We refer to the above six series of preferred stock herein collectively as the “Listed Preferred Stock”.

The Listed Preferred Stock is fully paid and nonassessable.

The terms of the depositary shares are summarized below under “Description of Depositary Shares”.

Ranking

The Listed Preferred Stock ranks, as to payment of dividends and distribution of assets upon our liquidation, dissolution or winding-up, on a parity with any series of preferred stock ranking on a parity with the Listed Preferred Stock and senior to our common stock and to any series of preferred stock ranking junior to the Listed Preferred Stock. The Listed Preferred Stock is subordinate to our existing and future indebtedness.

Dividend Rights

Holders of the Listed Preferred Stock are entitled to receive, when, as and if declared by our board of directors or any duly authorized committee of our board, cash dividends at the rates and on the dates described below under “Specific Terms of Listed Preferred Stock”. We will pay each dividend to the holders of record as they appear on our stock register on record dates determined by our board of directors or a duly authorized committee of our board. Dividends on the Listed Preferred Stock are noncumulative. If a dividend is not declared on any series of Listed Preferred Stock, because the dividends are noncumulative, then the right of holders of that series to receive that dividend will be lost, and we will have no obligation to pay the dividend for that dividend period, whether or not dividends are declared for any future dividend period.

We may not declare or pay or set aside for payment full dividends on any series of preferred stock ranking, as to dividends, equally with or junior to a series of Listed Preferred Stock unless we have previously declared and paid or set aside for payment, or we contemporaneously declare and pay or set aside for payment, full dividends on that series of Listed Preferred Stock for the most recently completed dividend period. When dividends are not paid in full on a particular series of Listed Preferred Stock and any other series of preferred stock ranking on a parity as to dividends with that series, all dividends declared and paid upon the shares of that series of Listed Preferred Stock and any other series of preferred stock ranking on a parity as to dividends with the that series will be declared and paid pro rata. For purposes of calculating the pro rata allocation of partial dividend payments, we will allocate dividend payments based on the ratio between the then-current dividends due on shares of that Listed Preferred Stock and (i) in the case of any series of non-cumulative preferred stock ranking on a parity as to dividends with that Listed Preferred Stock, the aggregate of the current and unpaid dividends due on such series of preferred stock and (ii) in the case of any series of cumulative preferred stock ranking on a parity as to dividends with that Listed Preferred Stock, the aggregate of the current and accumulated and unpaid dividends due on such series of preferred stock.

In addition, unless full dividends on all outstanding shares of the Listed Preferred Stock have been declared and paid or a sum sufficient for the payment thereof set aside for such payment in respect of the applicable most recently completed dividend period, with respect to a particular series of Listed Preferred Stock:

- no dividend (other than a dividend in common stock or in any other capital stock ranking junior to that Listed Preferred Stock as to dividends and upon liquidation, dissolution or winding-up) will be declared or paid or a sum sufficient for the payment thereof set aside for such payment or other distribution declared or made upon our common stock or upon any other capital stock ranking junior to that Listed Preferred Stock as to dividends or upon liquidation, dissolution or winding-up, and

- no common stock or other capital stock ranking junior or equally with that Listed Preferred Stock as to dividends or upon liquidation, dissolution or winding-up will be redeemed, purchased or otherwise acquired for any consideration (or any moneys be paid to or made available for a sinking fund for the redemption of any shares of any such capital stock) by us, except:
 - (1) by conversion into or exchange for capital stock ranking junior to that Listed Preferred Stock;
 - (2) as a result of reclassification into capital stock ranking junior to that Listed Preferred Stock;
 - (3) through the use of the proceeds of a substantially contemporaneous sale of shares of capital stock ranking junior to that Listed Preferred Stock or, in the case of capital stock ranking on a parity with that Listed Preferred Stock, through the use of the proceeds of a substantially contemporaneous sale of other shares of capital stock ranking on a parity with that Listed Preferred Stock;
 - (4) in the case of capital stock ranking on a parity with that Listed Preferred Stock, pursuant to pro rata offers to purchase all or a pro rata portion of the shares of that Listed Preferred Stock and such capital stock ranking on a parity with that Listed Preferred Stock;
 - (5) in connection with the satisfaction of our obligations pursuant to any contract entered into in the ordinary course prior to the beginning of the most recently completed dividend period; or
 - (6) any purchase, redemption or other acquisition of capital stock ranking junior to that Listed Preferred Stock pursuant to any of our or our subsidiaries' employee, consultant or director incentive or benefit plans or arrangements (including any employment, severance or consulting arrangements) adopted before or after the issuance of that Listed Preferred Stock).

However, the foregoing will not restrict our ability or the ability of any of our affiliates to engage in underwriting, stabilization, market-making or similar transactions in our capital stock in the ordinary course of business. Subject to the conditions described above, and not otherwise, dividends (payable in cash, capital stock, or otherwise), as may be determined by our board of directors or a duly authorized committee of our board, may be declared and paid on our common stock and any other capital stock ranking junior to or on a parity with the Listed Preferred Stock from time to time out of any assets legally available for such payment, and the holders of the Listed Preferred Stock will not be entitled to participate in those dividends.

As used herein, "junior to a series of Listed Preferred Stock" and like terms refer to our common stock and any other class or series of our capital stock over which the Listed Preferred Stock has preference or priority, either as to dividends or upon liquidation, dissolution or winding-up, or both, as the context may require; "parity preferred stock" and "on a parity with a series of Listed Preferred Stock" and like terms refer to any class or series of our capital stock that ranks on a parity with the shares of a particular series of Listed Preferred Stock, either as to dividends or upon liquidation, dissolution or winding-up, or both, as the context may require; and "senior to a series of Listed Preferred Stock" and like terms refer to any class or series of our capital stock that ranks senior to a particular series of Listed Preferred Stock, either as to dividends or upon liquidation, dissolution or winding-up, or both, as the context may require.

We will compute the amount of dividends payable by annualizing the applicable dividend rate and dividing by the number of dividend periods in a year, except that the amount of dividends payable for any period greater or less than a full dividend period, other than the initial dividend period, will be computed on the basis of a 360-day year consisting of twelve 30-day months and, for any period less than a full month, the actual number of days elapsed in the period. Dollar amounts resulting from that calculation will be rounded to the nearest cent, with one-half cent being rounded upward.

Rights Upon Liquidation

In the event of our voluntary or involuntary liquidation, dissolution or winding-up, holders of each series of Listed Preferred Stock will be entitled to receive and to be paid out of our assets legally available for distribution to our stockholders the amount of \$10,000 per share, plus any declared and unpaid dividends, without accumulation of undeclared dividends, before we make any distribution of assets to the holders of our common stock or any other class or series of shares ranking junior to the Listed Preferred Stock of such series. After the payment to such holders of the full preferential amounts to which they are entitled, such holders will have no right or claim to any of our remaining assets.

If, upon our voluntary or involuntary liquidation, dissolution or winding-up, we fail to pay in full the amounts payable with respect to a particular series of Listed Preferred Stock, and any stock having the same rank as that series, the holders of that series and of that other stock will share ratably in any such distribution of our assets in proportion to the full respective distributions to which they are entitled. For any series of Listed Preferred Stock, neither the sale of all or substantially all of our property or business, nor our merger or consolidation into or with any other entity will be considered a liquidation, dissolution or winding-up, voluntary or involuntary, of us.

Because we are a holding company, our rights and the rights of our creditors and our stockholders, including the holders of the Listed Preferred Stock, to participate in the assets of any of our subsidiaries upon that subsidiary's liquidation, dissolution, winding-up or

recapitalization may be subject to the prior claims of that subsidiary's creditors, except to the extent that we are a creditor with recognized claims against the subsidiary.

Holders of the Listed Preferred Stock are subordinate to all of our indebtedness and to other non-equity claims on us and our assets, including in the event that we enter into a receivership, insolvency, liquidation or similar proceeding. In addition, holders of the Listed Preferred Stock may be fully subordinated to interests held by the U.S. government in the event that we enter into a receivership, insolvency, liquidation or similar proceeding.

Redemption

We may redeem each series of Listed Preferred Stock on the dates and at the redemption prices set forth below under "Specific Terms of Listed Preferred Stock". In addition, we may redeem each series of Listed Preferred Stock in whole, but not in part, at a redemption price equal to \$10,000 per share (equivalent to \$25 per depository share), plus any declared and unpaid dividends, following the occurrence of a capital treatment event. For these purposes, "capital treatment event" means the good faith determination by JPMorgan Chase that, as a result of any:

- amendment to, or change or any announced prospective change in, the laws or regulations of the United States or any political subdivision of or in the United States that is enacted or becomes effective after the initial issuance of any shares of such series of Listed Preferred Stock;
- proposed change in those laws or regulations that is announced or becomes effective after the initial issuance of any shares of such series of Listed Preferred Stock; or
- official administrative decision or judicial decision or administrative action or other official pronouncement interpreting or applying those laws or regulations that is announced or becomes effective after the initial issuance of any shares of such series of Listed Preferred Stock,

there is more than an insubstantial risk that JPMorgan Chase will not be entitled to treat an amount equal to the full liquidation amount of all shares of such series of Listed Preferred Stock then outstanding as "additional Tier 1 capital" (or its equivalent) for purposes of the capital adequacy guidelines or regulations of the appropriate federal banking agency, as then in effect and applicable, for as long as any share of such series of Listed Preferred Stock is outstanding. Redemption of any Listed Preferred Stock is subject to our receipt of any required approvals from the Federal Reserve Board or any other regulatory authority.

If we elect to redeem shares of a series of Listed Preferred Stock, we will provide notice by first class mail, postage prepaid, addressed to the holders of record of such shares to be redeemed. Such mailing will be at least 30 days and not more than 60 days before the date fixed for redemption. Any notice so mailed will be conclusively presumed to have been duly given, whether or not the holder receives such notice, but failure to duly give such notice by mail, or any defect in such notice or in the mailing thereof, to any holder of shares of the series designated for redemption will not affect the validity of the proceedings for the redemption of any other shares of that series. Each notice of redemption will state:

- the redemption date;
- the number of shares of the series of Listed Preferred Stock to be redeemed and, if fewer than all the shares held by such holder are to be redeemed, the number of such shares to be redeemed from such holder;
- the redemption price;
- the place or places where the certificates representing such shares are to be surrendered for payment of the redemption price; and
- that dividends on the shares to be redeemed will cease to accrue on the redemption date.

Notwithstanding the foregoing, if the series of Listed Preferred Stock is held in book-entry form through The Depository Trust Company, or "DTC", we may give such notice in any manner permitted or required by DTC. For each series of Listed Preferred Stock, neither the holders of a series nor the holders of the related depository shares have the right to require redemption of such series of Listed Preferred Stock.

In the case of any redemption of only part of the shares a series of Listed Preferred Stock at the time outstanding, the shares of the series to be redeemed will be selected either pro rata from the holders of record of that series in proportion to the number of shares held by such holders or by lot. From and after the redemption date, dividends will cease to accumulate on the shares of Listed Preferred Stock called for redemption up to the redemption date and all rights of the holders of those shares, except the right to receive the redemption price, will cease.

In the event that we fail to pay full dividends, including accumulated but unpaid dividends, if any, on any series of Listed Preferred Stock, we may not redeem that series in part and we may not purchase or acquire any shares of that series, except by a purchase or exchange offer made on the same terms to all holders of that series.

Preemptive and Conversion Rights

The Listed Preferred Stock is not subject to any preemptive rights and is not convertible into property or shares of any other class or series of our capital stock.

Depository, Transfer Agent, and Registrar

Computershare Inc. is the depository, transfer agent and registrar for each series of the Listed Preferred Stock and the related depository shares.

Voting Rights

Except as indicated below or except as expressly required by applicable law, the holders of the Listed Preferred Stock are not entitled to vote. Each share of Listed Preferred Stock a series is entitled to one vote on matters on which holders of that series are entitled to vote. The voting power of each series of Listed Preferred Stock depends on the number of shares in that series, and not on the aggregate liquidation preference or initial offering price of the shares of that series.

If, at any time or times, the equivalent of an aggregate of six quarterly dividends, whether or not consecutive, for any series of Listed Preferred Stock has not been paid, the number of directors constituting our board of directors will be automatically increased by two and the holders of each outstanding series of Listed Preferred Stock with such voting rights, together with holders of such other shares of any other class or series of parity preferred stock outstanding at the time upon which like voting rights have been conferred and are exercisable, which we refer to as “voting parity stock,” voting together as a class, will be entitled to elect those additional two directors, which we refer to as “preferred directors,” at that annual meeting and at each subsequent annual meeting of stockholders until full dividends have been paid for at least four quarterly consecutive dividend periods. At that time such right will terminate, except as expressly provided in the applicable certificate of designations or by law, subject to revesting. Upon any termination of the right of the holders of the Listed Preferred Stock and voting parity stock as a class to vote for directors as provided above, the preferred directors will cease to be qualified as directors, the term of office of all preferred directors then in office will terminate immediately and the authorized number of directors will be reduced by the number of preferred directors elected. Any preferred director may be removed and replaced at any time, with cause as provided by law or without cause by the affirmative vote of the holders of shares of the Listed Preferred Stock, voting together as a class with the holders of shares of voting parity stock, to the extent the voting rights of such holders described above are then exercisable. Any vacancy created by removal with or without cause may be filled only as described in the preceding sentence. If the office of any preferred director becomes vacant for any reason other than removal, the remaining preferred director may choose a successor who will hold office for the unexpired term in respect of which such vacancy occurred.

So long as any shares of a particular series of Listed Preferred Stock remains outstanding, we will not, without the affirmative vote of the holders of at least 66 2/3% in voting power of that series and any voting parity stock, voting together as a class, authorize, create or issue any capital stock ranking senior to that series as to dividends or upon liquidation, dissolution or winding-up, or reclassify any authorized capital stock into any such shares of such capital stock or issue any obligation or security convertible into or evidencing the right to purchase any such shares of capital stock. So long as any shares of a particular series of Listed Preferred Stock remain outstanding, we will not, without the affirmative vote of the holders of at least 66 2/3% in voting power of that series, amend, alter or repeal any provision of the applicable certificate of designations or our certificate of incorporation, including by merger, consolidation or otherwise, so as to adversely affect the powers, preferences or special rights of that series.

Notwithstanding the foregoing, none of the following will be deemed to adversely affect the powers, preferences or special rights of any series of Listed Preferred Stock:

- any increase in the amount of authorized common stock or authorized preferred stock, or any increase or decrease in the number of shares of any series of preferred stock, or the authorization, creation and issuance of other classes or series of capital stock, in each case ranking on a parity with or junior to that series of Listed Preferred Stock as to dividends or upon liquidation, dissolution or winding-up;
- a merger or consolidation of JPMorgan Chase with or into another entity in which the shares of that series remain outstanding; and
- a merger or consolidation of JPMorgan Chase with or into another entity in which the shares of the that series are converted into or exchanged for preference securities of the surviving entity or any entity, directly or indirectly, controlling such surviving entity and such new preference securities have powers, preferences and special rights that are not materially less favorable than that series;

provided that if the amendment would adversely affect such series but not any other series of preferred stock outstanding, then the amendment will only need to be approved by holders of at least two-thirds of the shares of the series of Listed Preferred Stock adversely affected.

In exercising the voting rights described above or when otherwise granted voting rights by operation of law or by us, each share of Listed Preferred Stock with respect to a series will be entitled to one vote (equivalent to 1/400th of a vote per relevant depository share).

If we redeem or call for redemption all outstanding shares of a series of Listed Preferred Stock and irrevocably deposit in trust sufficient funds to effect such redemption, at or prior to the time when the act with respect to which such vote would otherwise be

required or upon which the holders of such series will be entitled to vote will be effected, the voting provisions described above will not apply.

Our board of directors may also from time to time, without notice to or consent of holders of a series of Listed Preferred Stock, issue additional shares of such series. Delaware law provides that the holders of preferred stock will have the right to vote separately as a class on any amendment to our certificate of incorporation (including any certificate of designations) that would increase or decrease the aggregate number of authorized shares of such class, increase or decrease the par value of such class or adversely affect the powers, preferences and special rights of the shares of preferred stock. Notwithstanding the foregoing, as permitted by law, our certificate of incorporation provides that any increase or decrease in our authorized capital stock may be adopted by the affirmative vote of holders of capital stock representing not less than a majority of the voting power represented by the outstanding shares of our capital stock entitled to vote. If any proposed amendment would alter or change the powers, preferences or special rights of one or more series of preferred stock so as to affect them adversely, but would not so affect the entire class of preferred stock, only the shares of the series so affected will be considered a separate class for purposes of this vote on the amendment. This right is in addition to any voting rights that may be provided for in our certificate of incorporation (including any certificate of designations).

Under regulations adopted by the Federal Reserve Board, if the holders of any series of our preferred stock become entitled to vote for the election of directors because dividends on that series are in arrears, that series may then be deemed a “class of voting securities.” In such a case, a holder of 25% or more of the series, or a holder of 5% or more if that holder would also be considered to exercise a “controlling influence” over JPMorgan Chase, may then be subject to regulation as a bank holding company in accordance with the Bank Holding Company Act. In addition, (1) any other bank holding company may be required to obtain the prior approval of the Federal Reserve Board to acquire or retain 5% or more of that series, and (2) any person other than a bank holding company may be required to provide notice to the Federal Reserve Board prior to acquiring or retaining 10% or more of that series.

Description of Depositary Shares

The following summary of the terms of the depositary shares representing each series of the Listed Preferred Stock is not complete. You should refer to each of the deposit agreements among us, the depositary, and the holders from time to time of the depositary receipts evidencing the depositary shares relating to each series of the Listed Preferred Stock for the complete terms of those depositary shares. Each of those deposit agreements has been filed as an exhibit to a Current Report on Form 8-K filed in connection with the issuance of the depositary shares representing each series of the Listed Preferred Stock.

General. Each depositary share represents a 1/400th interest in a share of the relevant series of Listed Preferred Stock, and is evidenced by depositary receipts. In connection with the issuance of each series of Listed Preferred Stock, we deposited shares of that series of Listed Preferred Stock with Computershare Inc., as depositary under the deposit agreement relating to that series of Listed Preferred Stock. Subject to the terms of each deposit agreement, the depositary shares are entitled to all the powers, preferences and special rights of the relevant series of Listed Preferred Stock, as applicable, in proportion to the applicable fraction of a share of Listed Preferred Stock those depositary shares represent.

Dividends and Other Distributions. Each dividend payable on a depositary share will be in an amount equal to 1/400th of the dividend declared and payable on the related share of the Listed Preferred Stock.

The depositary will distribute all dividends and other cash distributions received on the relevant series of Listed Preferred Stock to the holders of record of the related depositary receipts in proportion to the number of depositary shares held by each holder. In the event of a distribution other than in cash, the depositary will distribute property received by it to the holders of record of the depositary receipts as nearly as practicable in proportion to the number of depositary shares held by each holder, unless the depositary determines that this distribution is not feasible, in which case the depositary may, with our approval, adopt a method of distribution that it deems practicable, including the sale of the property and distribution of the net proceeds of that sale to the holders of the depositary receipts.

Record dates for the payment of dividends and other matters relating to the depositary shares will be the same as the corresponding record dates for the related shares of Listed Preferred Stock.

The amount paid as dividends or otherwise distributable by the depositary with respect to the depositary shares or the underlying Listed Preferred Stock will be reduced by any amounts required to be withheld by us or the depositary on account of taxes or other governmental charges.

Redemption of Depositary Shares. If we redeem a series of Listed Preferred Stock, in whole or from time to time in part, the corresponding depositary shares also will be redeemed with the proceeds received by the depositary from the redemption of the Listed Preferred Stock held by the depositary. The redemption price per depositary share will be 1/400th of the redemption price per share payable with respect to the Listed Preferred Stock, plus any declared and unpaid dividends, without accumulation of undeclared dividends.

If we redeem shares of a series of Listed Preferred Stock held by the depositary, the depositary will redeem, as of the same redemption date, the number of depositary shares representing those shares of the Listed Preferred Stock so redeemed. If we

redeem less than all of the outstanding depositary shares, the depositary will select pro rata or by lot those depositary shares to be redeemed. The depositary will mail notice of redemption to record holders of the depositary receipts not less than 30 and not more than 60 days prior to the date fixed for redemption of the Listed Preferred Stock and the related depositary shares.

The redemption of depositary shares that are held in book-entry form through DTC will be effected in accordance with the applicable procedures of DTC.

Voting the Listed Preferred Stock. Because each depositary share represents a 1/400th interest in a share of Listed Preferred Stock, holders of depositary receipts will be entitled to 1/400th of a vote per depositary share under those limited circumstances in which holders of the Listed Preferred Stock are entitled to a vote.

When the depositary receives notice of any meeting at which the holders of a series of Listed Preferred Stock are entitled to vote, the depositary will mail the information contained in the notice to the record holders of the depositary shares relating to that Listed Preferred Stock. Each record holder of the depositary shares on the record date, which will be the same date as the record date for the applicable Listed Preferred Stock, may instruct the depositary to vote the amount of the Listed Preferred Stock represented by the holder's depositary shares. To the extent practicable, the depositary will vote the amount of the Listed Preferred Stock represented by depositary shares in accordance with the instructions it receives. We will agree to take all actions that the depositary determines are necessary to enable the depositary to vote as instructed. If the depositary does not receive specific instructions from the holders of any depositary shares representing the Listed Preferred Stock, it will abstain from voting with respect to such shares.

Withdrawal of Listed Preferred Stock. Underlying shares of Listed Preferred Stock may be withdrawn from the depositary arrangement upon surrender of depositary receipts at the depositary's office and upon payment of the taxes, charges and fees provided for in the deposit agreement. Subject to the terms of the relevant deposit agreement, the holder of depositary receipts will receive the appropriate number of shares of Listed Preferred Stock represented by such depositary shares. Only whole shares of Listed Preferred Stock may be withdrawn; if a holder holds an amount other than a whole multiple of 400 depositary shares, the depositary will deliver along with the withdrawn shares of Listed Preferred Stock a new depositary receipt evidencing the excess number of depositary shares. Holders of withdrawn shares of Listed Preferred Stock will not be entitled to redeposit such shares or to receive depositary shares.

Form and Notices. Each series of Listed Preferred Stock was issued in registered form to the depositary, and the depositary shares representing that Listed Preferred Stock were issued in book-entry only form through DTC. The depositary will forward to the holders of depositary shares all reports, notices, and communications from us that are delivered to the depositary and that we are required to furnish to the holders of the Listed Preferred Stock.

Amendment and Termination of the Deposit Agreement. We and the depositary may amend any form of depositary receipt evidencing depositary shares and any provision of any deposit agreement at any time regarding any depositary shares. However, any amendment that materially and adversely alters the rights of the holders of depositary shares representing a particular series of Listed Preferred Stock or would be materially and adversely inconsistent with the rights granted to holders of that underlying Listed Preferred Stock pursuant to our certificate of incorporation will not be effective unless the amendment has been approved by the holders of at least a majority of the related depositary shares then outstanding. The deposit agreement relating to the depositary shares representing a particular series of Listed Preferred Stock may be terminated by us or by the depositary only if:

- all such outstanding depositary shares have been redeemed; or
- there has been a final distribution of the relevant underlying Listed Preferred Stock in connection with our liquidation, dissolution or winding up and the preferred stock has been distributed to the holders of depositary receipts.

Charges of Depositary. We will pay all transfer and other taxes and governmental charges arising solely from the existence of the depositary arrangements regarding any depositary shares. We also pay charges of the depositary in connection with the initial deposit of each series of Listed Preferred Stock and any redemption of the Listed Preferred Stock. Holders of depositary receipts will pay transfer and other taxes and governmental charges and other charges with respect to their depositary receipts as expressly provided in the deposit agreement.

Resignation and Removal of Depositary. With respect to the depositary shares representing each series of Listed Preferred Stock, the depositary may resign at any time by delivering a notice to us of its election to do so. We may remove the depositary at any time. Any such resignation or removal will take effect upon the appointment of a successor depositary and its acceptance of its appointment. We must appoint a successor depositary within 60 days after delivery of the notice of resignation or removal.

Miscellaneous. The depositary will forward to holders of applicable depositary receipts all reports and communications from us that we deliver to the depositary and that we are required to furnish to the holders of the relevant Listed Preferred Stock.

Neither we nor the depositary will be liable if either of us is prevented or delayed by law or any circumstance beyond our control in performing our respective obligations under any deposit agreement. Our obligations and those of the depositary will be limited to performing in good faith our respective duties under any deposit agreement. Neither we nor the depositary will be obligated to prosecute or defend any legal proceeding relating to any depositary shares or Listed Preferred Stock unless satisfactory indemnity is

furnished. We and the depositary may rely upon written advice of counsel or accountants, or upon information provided by persons presenting preferred stock for deposit, holders of depositary receipts or other persons we believe to be competent, and on documents we believe to be genuine.

Specific Terms of Listed Preferred Stock

5.75% Non-Cumulative Preferred Stock, Series DD

On September 21, 2018, we issued an aggregate of 169,625 shares of 5.75% Non-Cumulative Preferred Stock, Series DD, \$1 par value, with a liquidation preference of \$10,000 per share (the "Series DD Preferred Stock"). Shares of the Series DD Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series DD Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 5.75% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on December 1, 2018. Dividends on the Series DD Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series DD Preferred Stock may be redeemed on any dividend payment date on or after December 1, 2023, in whole or from time to time in part, at a redemption price equal to \$10,000 per share (equivalent to \$25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series DD Preferred Stock following the occurrence of a "capital treatment event," as described above.

Listing. The depositary shares representing the Series DD Preferred Stock are listed on the NYSE under the trading symbol "JPM PR D".

6.00% Non-Cumulative Preferred Stock, Series EE

On January 24, 2019, we issued an aggregate of 185,000 shares of 6.00% Non-Cumulative Preferred Stock, Series EE, \$1 par value, with a liquidation preference of \$10,000 per share (the "Series EE Preferred Stock"). Shares of the Series EE Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series EE Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 6.00% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on June 1, 2019. Dividends on the Series EE Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series EE Preferred Stock may be redeemed on any dividend payment date on or after March 1, 2024, in whole or from time to time in part, at a redemption price equal to \$10,000 per share (equivalent to \$25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series EE Preferred Stock following the occurrence of a "capital treatment event," as described above.

Listing. The depositary shares representing the Series EE Preferred Stock are listed on the NYSE under the trading symbol "JPM PR C".

4.75% Non-Cumulative Preferred Stock, Series GG

On November 7, 2019, we issued an aggregate of 90,000 shares of 4.75% Non-Cumulative Preferred Stock, Series GG, \$1 par value, with a liquidation preference of \$10,000 per share (the "Series GG Preferred Stock"). Shares of the Series GG Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series GG Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 4.75% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on March 1, 2020. Dividends on the Series GG Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series GG Preferred Stock may be redeemed on any dividend payment date on or after December 1, 2024, in whole or from time to time in part, at a redemption price equal to \$10,000 per share (equivalent to \$25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series GG Preferred Stock following the occurrence of a "capital treatment event," as described above.

Listing. The depositary shares representing the Series GG Preferred Stock are listed on the NYSE under the trading symbol "JPM PR J".

4.55% Non-Cumulative Preferred Stock, Series JJ;

On March 17, 2021, we issued an aggregate of 150,000 shares of 4.55% Non-Cumulative Preferred Stock, Series JJ, \$1 par value, with a liquidation preference of \$10,000 per share (the "Series JJ Preferred Stock"). Shares of the Series JJ Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series JJ Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 4.55% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on June 1, 2021. Dividends on the Series JJ Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series JJ Preferred Stock may be redeemed on any dividend payment date on or after June 1, 2026, in whole or from time to time in part, at a redemption price equal to \$10,000 per share (equivalent to \$25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series JJ Preferred Stock following the occurrence of a “capital treatment event,” as described above.

Listing. The depositary shares representing the Series JJ Preferred Stock are listed on the NYSE under the trading symbol “JPM PR K”.

4.625% Non-Cumulative Preferred Stock, Series LL

On May 20, 2021, we issued an aggregate of 185,000 shares of 4.625% Non-Cumulative Preferred Stock, Series LL, \$1 par value, with a liquidation preference of \$10,000 per share (the “Series LL Preferred Stock”). Shares of the Series LL Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series LL Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 4.625% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on September 1, 2021. Dividends on the Series LL Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series LL Preferred Stock may be redeemed on any dividend payment date on or after June 1, 2026, in whole or from time to time in part, at a redemption price equal to \$10,000 per share (equivalent to \$25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series LL Preferred Stock following the occurrence of a “capital treatment event,” as described above.

Listing. The depositary shares representing the Series LL Preferred Stock are listed on the NYSE under the trading symbol “JPM PR L”.

4.20% Non-Cumulative Preferred Stock, Series MM

On July 29, 2021, we issued an aggregate of 200,000 shares of 4.20% Non-Cumulative Preferred Stock, Series MM, \$1 par value, with a liquidation preference of \$10,000 per share (the “Series MM Preferred Stock”). Shares of the Series MM Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series MM Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 4.20% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on December 1, 2021. Dividends on the Series MM Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series MM Preferred Stock may be redeemed on any dividend payment date on or after September 1, 2026, in whole or from time to time in part, at a redemption price equal to \$10,000 per share (equivalent to \$25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series MM Preferred Stock following the occurrence of a “capital treatment event,” as described above.

Listing. The depositary shares representing the Series MM Preferred Stock are listed on the NYSE under the trading symbol “JPM PR M”.

DESCRIPTION OF THE ALERIAN MLP INDEX ETNS DUE MAY 24, 2024

The following description of our Alerian MLP Index ETNs due May 24, 2024 (the “Alerian ETNs”) is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to the indenture dated May 25, 2001 (as may be amended or supplemented from time to time, the “2001 Indenture”), between JPMorgan Chase, as issuer, and Deutsche Bank Trust Company Americas (formerly known as Bankers Trust Company), as trustee (the “Trustee”), which is incorporated by reference as an Exhibit to the Form 10-K. We encourage you to read the 2001 Indenture for additional information.

General

In June 2012, the maximum number of Alerian ETNs authorized for issuance was set at 129,000,000, resulting in a maximum aggregate principal amount of \$2,455,722,690. All of the Alerian ETNs authorized for issuance were issued as of June 2012. 10,000,000 Alerian ETNs were retired on December 16, 2015. Accordingly, since the retirement of these notes, the maximum number of Alerian ETNs authorized for issuance is 119,000,000 with an aggregate principal amount of \$2,265,356,590, all of which has been issued and remain outstanding as of December 31, 2019.

The Alerian ETNs are linked to the Alerian MLP Index (the “Index”) and are our unsecured and unsubordinated obligations and will rank *pari passu* with all of our other unsecured and unsubordinated obligations. The Alerian ETNs do not guarantee any return of principal at, or prior to, maturity or upon early repurchase. **Any payment on the Alerian ETNs is subject to the credit risk of JPMorgan Chase & Co.**

The Alerian ETNs are part of a series of our debt securities entitled “Global Medium-Term Notes, Series E” (the “Series E Notes”) that we may issue under the 2001 Indenture from time to time. For more information about the Series E Notes, please see the section titled “General Terms of the Series E Notes” below.

The Alerian ETNs are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or by any other governmental agency, nor are they obligations of, or guaranteed by, a bank.

Unless otherwise specified, references herein to “holders” mean those in whose names the Alerian ETNs are registered on the books that we or the Trustee, or any successor trustee, as applicable, maintain for this purpose, and not those who own beneficial interests in the Alerian ETNs (registered in street name or otherwise).

Please see “Certain Defined Terms” below for an explanation of any capitalized terms used herein that are not otherwise defined.

The Index

The return of the Alerian ETNs is linked to the performance of the Index. The Index measures the composite performance of energy-oriented Master Limited Partnerships, or MLPs, and is calculated and maintained by S&P Dow Jones Indices LLC (the “Index Calculation Agent”), in consultation with GKD Index Partners, LLC (the “Index Sponsor”), using a float-adjusted, market capitalization methodology. MLPs are limited partnerships primarily engaged in the exploration, marketing, mining, processing, production, refining, storage, or transportation of any mineral or natural resource.

Denominations

The Alerian ETNs are denominated in U.S. dollars in minimum denominations equal to the \$19.03661 per note (the “Principal Amount”), which is the amount equal to the Initial VWAP Level (defined below), *divided* by ten.

Coupon Payments and the Accrued Tracking Fee

For each Alerian ETN a holder holds on the applicable Coupon Record Date, holders will receive on each Coupon Payment Date the “Coupon Amount,” which is an amount in cash equal to the difference between (a) the Reference Distribution Amount (defined below), calculated as of the corresponding Coupon Valuation Date and (b) the Accrued Tracking Fee (defined below), calculated as of the corresponding Coupon Valuation Date.

The Accrued Tracking Fee accrues on a daily basis at a rate of 0.85% per annum, applied to the Daily Note Value as of the Index Business Day immediately preceding the corresponding Coupon Valuation Date. The Daily Note Value reflects the cumulative performance of the VWAP Level of the Index since April 1, 2009, which we refer to as the Inception Date. If the Daily Note Value increases, the Accrued Tracking Fee will increase, and if the Daily Note Value decreases, the Accrued Tracking Fee will decrease. The Daily Note Value is published on the Bloomberg Professional[®] service (“Bloomberg”) under the ticker symbol “AMJIVWAP” and on Bloomberg.com under the ticker symbol “AMJIVWAP:IND.”

On any Index Business Day, the VWAP Level reflects the weighted VWAPs of the Index Components, and the VWAP of each Index Component is the volume-weighted average price of one share of that Index Component as determined by the VWAP Calculation Agent based on the Primary Exchange for that Index Component.

To the extent the Reference Distribution Amount on any Coupon Valuation Date is less than the Accrued Tracking Fee on the corresponding Coupon Valuation Date, there will be no coupon payment made on the corresponding Coupon Payment Date, and an amount equal to the difference between the Accrued Tracking Fee and the Reference Distribution Amount (the “Tracking Fee Shortfall”) will be included in the Accrued Tracking Fee for the next Coupon Valuation Date. This will be in addition to the accrual at a rate of 0.85% per annum over the quarter that has elapsed since the previous date of determination. This process will be repeated to the extent necessary until the Reference Distribution Amount for a Coupon Valuation Date is greater than the Accrued Tracking Fee for the corresponding Coupon Valuation Date (which includes the accumulated Tracking Fee Shortfall from all prior quarters). This process may also restart as necessary on a subsequent Coupon Valuation Date. Coupon payments on the Alerian ETNs will be payable quarterly in arrears on the fifteenth Index Business Day following each Coupon Valuation Date, *provided* that the final Coupon Payment Date will be the Maturity Date. The final Coupon Amount will be included in the Cash Settlement Amount.

Holders will receive no coupon payment on a Coupon Payment Date if the Reference Distribution Amount on the relevant Coupon Valuation Date is less than the Accrued Tracking Fee on the relevant Coupon Valuation Date.

On each Index Business Day, the Note Calculation Agent will calculate the value of the Coupon Amount as of the immediately preceding Index Business Day (treating that immediately preceding Index Business Day as if it were a Coupon Valuation Date), which we refer to as the interim accrued Coupon Amount, and will publish the interim accrued Coupon Amount on Bloomberg under the ticker symbol “AMJEU” and on Bloomberg.com under the ticker symbol “AMJEU:IND.” While the interim accrued Coupon Amount is calculated and published in connection with each such Index Business Day, the actual Coupon Amount will be calculated and paid only once each quarter.

Payment Upon Early Repurchase

Subject to a holder's compliance with the procedures and the potential postponements and adjustments as described under “Market Disruption Events” below, that holder may submit a request once a week (generally on or before 11:00 a.m., New York City time, on Thursday) during the term of the Alerian ETNs to have us repurchase that holder's Alerian ETNs, *provided* that holder requests that we repurchase a minimum of 50,000 Alerian ETNs. If a holder requests that we repurchase that holder's Alerian ETNs, subject to the notification requirements and the other terms and conditions set forth under “Repurchase Requirements” below, for each Alerian ETN that holder will receive a cash payment on the relevant Repurchase Date equal to the Repurchase Amount. If the Repurchase Amount is \$0 or less, the payment upon early repurchase will be \$0. Because the Repurchase Amount is based on the value of the Index at the end of a five-day measurement period that begins after a repurchase request is received, holders will not know the Repurchase Amount they will receive at the time they elect to request that we repurchase their Alerian ETNs.

The Repurchase Amount is calculated by adjusting the Principal Amount to reflect:

- the return of the Index from the Initial VWAP Level to the Final VWAP Level;
- the deduction of the Accrued Tracking Fee;
- the deduction of the Repurchase Fee;
- the addition of other adjustments representing accrued but unpaid coupons, which include the following:
 - the Coupon Amount with respect to the Coupon Valuation Date immediately preceding the applicable Repurchase Valuation Date (generally the last Index Business Day of the week in which a repurchase is requested) if, on the last Index Business Day in the Repurchase Measurement Period the Coupon Ex-Date with respect to that Coupon Amount has not yet occurred. The Repurchase Measurement Period is a five-Index Business Day period commencing on the Repurchase Valuation Date during which the Final VWAP Level will be determined;
 - an Adjusted Coupon Amount, if any, that reflects certain cash distributions on the Index Components with ex-dividend dates from and excluding the immediately preceding Coupon Valuation Date to and including the applicable Repurchase Valuation Date, less the Accrued Tracking Fee; and
 - certain cash distributions on the Index Components with ex-dividend dates during the Repurchase Measurement Period.

For purposes of determining the Cash Settlement Amount, the Final VWAP Level will be the arithmetic mean of the VWAP Levels measured on each Index Business Day in the Repurchase Measurement Period, as calculated by the VWAP Calculation Agent.

The Repurchase Fee Amount is equal to 0.125% of the Principal Amount, adjusted to reflect:

- the return of the Index from the Initial VWAP Level to the Final VWAP Level;
- the deduction of the Accrued Tracking Fee; and
- the addition of certain cash distributions on the Index Components with ex-dividend dates during the Repurchase Measurement Period.

Accordingly, the Repurchase Fee Amount will vary based on the performance of the Index, the Accrued Tracking Fee and certain cash distributions on the Index Components with ex-dividend dates during the Repurchase Measurement Period.

Holders may lose some or all of their investment upon early repurchase. Because the Accrued Tracking Fee reduces their final payment, holders will likely lose some or all of their principal amount upon early repurchase if the Final VWAP Level is less than the Initial VWAP Level or if the Final VWAP Level is not greater than the Initial VWAP Level by an amount that is sufficient to offset the negative effect of the Accrued Tracking Fee and the Repurchase Fee.

Repurchase Requirements

To exercise the right to have us repurchase a holder's Alerian ETNs on a weekly basis, that holder must instruct that holder's broker or other person through whom that holder holds the Alerian ETNs to take the following steps:

- Send a notice of repurchase, substantially in the specified form (a “Repurchase Notice”), to us via email at ETN_Repurchase@jpmorgan.com by no later than 11:00 a.m., New York City time, during the term of the Alerian ETNs, each week on the Business Day immediately preceding the applicable Repurchase Valuation Date (generally Thursday);

- If we receive that holder's Repurchase Notice by the time specified in the preceding bullet point, we will respond by sending that holder a confirmation of repurchase, substantially in the specified form (a "Repurchase Confirmation");
- Deliver the signed Repurchase Confirmation, in the specified form, to us via facsimile to (917) 456-3471, by 4:00 p.m., New York City time, on the Business Day on which that holder submitted that holder's Repurchase Notice. We or our affiliate must acknowledge receipt in order for that holder's Repurchase Confirmation to be effective;
- Instruct DTC custodian for that holder to book a delivery versus payment trade with respect to that holder's Alerian ETNs on the relevant Repurchase Valuation Date at a price equal to the applicable Repurchase Amount; and
- Cause that holder's DTC custodian to deliver the trade as booked for settlement via DTC at or prior to 10:00 a.m. New York City time on the relevant Repurchase Date.

Different brokerage firms may have different deadlines for accepting instructions from their customers. Accordingly, holders should consult the brokerage firm through which they own their interest in the offered Alerian ETNs in respect of such deadlines. If we do not receive a holder's Repurchase Notice by 11:00 a.m., or a holder's Repurchase Confirmation by 4:00 p.m., on the Business Day immediately preceding the applicable Repurchase Valuation Date, that holder's Repurchase Notice will not be effective and we will not repurchase that holder's Alerian ETNs on the relevant Repurchase Date.

The Note Calculation Agent will, in its sole discretion, resolve any questions that may arise as to the validity of a Repurchase Notice and the timing of receipt of a Repurchase Notice or as to whether and when the required deliveries have been made. Once given, a Repurchase Notice may not be revoked.

Expiration of Repurchase Rights

If we do not receive a holder's Repurchase Notice by 11:00 a.m., New York City time (as described under the first bullet point in "Repurchase Requirements" above), or a holder's Repurchase Confirmation by 4:00 p.m., New York City time (as described under the third bullet point in "Repurchase Requirements" above) on the Business Day immediately preceding the applicable Repurchase Valuation Date (generally Thursday), that holder's Repurchase Notice will not be effective and we will not repurchase that holder's Alerian ETNs on the relevant Repurchase Date. Any Repurchase Notice for which we (or our affiliate) receive a valid Repurchase Confirmation in accordance with the procedures described above will be irrevocable.

Payment at Maturity

For each Alerian ETN, unless earlier repurchased, holders will receive at maturity a cash payment equal to the Cash Settlement Amount. If the Cash Settlement Amount is \$0 or less, the payment at maturity will be \$0.

The Cash Settlement Amount is calculated by adjusting the Principal Amount to reflect:

- the return of the Index from the Initial VWAP Level to the Final VWAP Level;
- the addition of the final Coupon Amount, if any,
- the deduction of the Accrued Tracking Fee; and
- the addition of certain cash distributions on the Index Components with ex-dividend dates during the Final Measurement Period.

The Final Measurement Period is a five Index Business Day period near the Maturity Date of the Alerian ETNs during which the Final VWAP Level will be determined.

For purposes of determining the Cash Settlement Amount, the Final VWAP Level will be the arithmetic mean of the VWAP Levels measured on each Index Business Day in the Final Measurement Period, as calculated by the VWAP Calculation Agent. The Initial VWAP Level is the arithmetic mean of the VWAP Levels measured on each Index Business Day over a three Index Business Day period ending on the Inception Date, as calculated by the VWAP Calculation Agent.

Holders may lose some or all of their investment at maturity. Because the Accrued Tracking Fee reduces their final payment, holders will likely lose some or all of their principal amount at maturity if the Final VWAP Level is less than the Initial VWAP Level or if the Final VWAP Level is not greater than the Initial VWAP Level by an amount that is sufficient to offset the negative effects of the Accrued Tracking Fee.

Note Calculation Agent

J.P. Morgan Securities LLC, or JPMS (the "Note Calculation Agent"), will make all necessary calculations and determinations in connection with the Alerian ETNs, including calculations and determinations relating to any payments on the Alerian ETNs, other than those to be made by the VWAP Calculation Agent described below.

VWAP Calculation Agent

The JPMorgan Global Index Research Group (the “VWAP Calculation Agent”), one of our affiliates, will on each day that is not a Disrupted Day (as defined below) act as the VWAP Calculation Agent. The VWAP Calculation Agent will determine the VWAP of any Index Component, the VWAP Level and the Final VWAP Level on any Index Business Day on which such VWAP, VWAP Level and Final VWAP Level are to be determined during the term of the Alerian ETNs.

Market Disruption Events

To the extent a Disrupted Day (as defined below) exists with respect to an Index Component on an Averaging Date (as defined below), the VWAP and published share weighting with respect to such Index Component (and only with respect to such Index Component) for such Averaging Date will be determined by the Note Calculation Agent or one of its affiliates on the first succeeding Index Business Day that is not a Disrupted Day (the “Deferred Averaging Date”) with respect to such Index Component irrespective of whether pursuant to such determination, the Deferred Averaging Date would fall on a date originally scheduled to be an Averaging Date. For the avoidance of doubt, if the postponement described in the preceding sentence results in the VWAP of a particular Index Component being calculated on a day originally scheduled to be an Averaging Date, for purposes of determining the VWAP Levels on the Index Business Days during the Final Measurement Period or during the Repurchase Measurement Period, as applicable, the Note Calculation Agent or one of its affiliates, as the case may be, will apply the VWAP and the published share weighting with respect to such Index Component for such Deferred Averaging Date to the calculation of the VWAP Level (i) on the date(s) of the original disruption with respect to such Index Component and (ii) such Averaging Date.

In no event, however, will any postponement pursuant to the immediately preceding paragraph result in the final Averaging Date with respect to any Index Component occurring more than three Index Business Days following the day originally scheduled to be the final Averaging Date. If the third Index Business Day following the date originally scheduled to be the final Averaging Date is not an Index Business Day or is a Disrupted Day with respect to such Index Component, the Note Calculation Agent or one of its affiliates, will determine the VWAP and share weighting with respect to any Index Component required to be determined for the purpose of calculating the applicable VWAP Level based on its good faith estimate of the VWAP and share weighting of each such Index Component that would have prevailed on the Primary Exchange on such third Index Business Day but for such suspension or limitation.

An “Averaging Date” means each of the Index Business Days during the Final Measurement Period or the Repurchase Measurement Period, as applicable, subject to adjustment as described herein.

A “Disrupted Day” with respect to any Index Component is any Index Business Day on which the Primary Exchange or any Related Exchange fails to open for trading during its regular trading session or on which a Market Disruption Event has occurred and is continuing, and, in both cases, the occurrence of which is determined by the Note Calculation Agent to have a material effect on the VWAP Level.

With respect to an Index Component, a “Market Disruption Event,” means:

(a) the occurrence or existence of a condition specified below:

(i) any suspension, absence or limitation of trading on the Primary Exchange for trading in the Index Component, whether by reason of movements in price exceeding limits permitted by the Primary Exchange or otherwise;

(ii) any suspension, absence or limitation of trading on the Related Exchange for trading in futures or options contracts related to the Index Component, whether by reason of movements in price exceeding limits permitted by such Related Exchange or otherwise; or

(iii) any event (other than an event described in (b) below) that disrupts or impairs (as determined by the Note Calculation Agent) the ability of market participants in general (A) to effect transactions in, or obtain market values for the relevant Index Component or (B) to effect transactions in, or obtain market values for, futures or options contracts relating to the relevant Index Component; or

(b) the closure on any Index Business Day of the Primary Exchange or any Related Exchange prior to its Scheduled Closing Time unless such earlier closing time is announced by the Primary Exchange or such Related Exchange at least one hour prior to the earlier of (i) the actual closing time for the regular trading session on the Primary Exchange or such Related Exchange on such Index Business Day and (ii) the submission deadline for orders to be entered into the Primary Exchange or such Related Exchange system for execution at the close of trading on such Index Business Day;

in each case determined by the Note Calculation Agent in its sole discretion; and

(c) a determination by the Note Calculation Agent in its sole discretion that the applicable event described above materially interfered with our ability or the ability of any of our affiliates to adjust or unwind all or a material portion of any hedge with respect to the Alerian ETNs.

For purposes of the above definition:

(a) a limitation on the hours or number of days of trading will not constitute a Market Disruption Event if it results from an announced change in the regular business hours of the Primary Exchange or Related Exchange, and

(b) for purposes of clause (a) above, limitations pursuant to the rules of any Primary Exchange or Related Exchange similar to NYSE Rule 80B or Nasdaq Rule 4120 (or any applicable rule or regulation enacted or promulgated by any other self-regulatory organization or any government agency of scope similar to NYSE Rule 80B or Nasdaq Rule 4120 as determined by the Note Calculation Agent) on trading during significant market fluctuations will constitute a suspension, absence or material limitation of trading.

“Scheduled Closing Time” means, with respect to the Primary Exchange or the Related Exchange, on any Index Business Day, the scheduled weekday closing time of the Primary Exchange or such Related Exchange on such Index Business Day, without regard to after hours or any other trading outside of the regular trading session hours.

Discontinuation of the Index; Alteration of Method of Calculation

If the Index Calculation Agent discontinues publication of or otherwise fails to publish the Index, or the Index Calculation Agent does not make the Index Components, their share weighting and/or the Index Divisor available to the VWAP Calculation Agent, and the Index Sponsor, the Index Calculation Agent or another entity publishes a successor or substitute index that the Note Calculation Agent determines to be comparable to the discontinued Index and for which the Index Components, their share weighting, and/or the Index Divisor are available to the VWAP Calculation Agent (such index being referred to herein as a “successor index”), then the VWAP Level for such successor index will be determined by the VWAP Calculation Agent by reference to the sum of the products of the VWAPs of the components underlying such successor index on the Primary Exchanges and each such component's respective weighting within the successor index (which sum will be adjusted by any index divisor used by such successor index) on the dates and at the times as of which the VWAP Levels for such successor index are to be determined.

Upon any selection by the Note Calculation Agent of a successor Index, the Note Calculation Agent will cause written notice thereof to be furnished to the Trustee, to us and to the holders of the Alerian ETNs.

If the Index Calculation Agent discontinues publication of the Index or does not make the Index Components, their share weightings and/or Index Divisor available to the VWAP Calculation Agent prior to, and such discontinuation or unavailability is continuing on the Calculation Date or any Index Business Day during the Final Measurement Period or during the Repurchase Measurement Period, as applicable, or any other relevant date on which the VWAP Level is to be determined and the Note Calculation Agent determines that no successor index is available at such time, or the Note Calculation Agent has previously selected a successor index and publication of such successor index is discontinued prior to, and such discontinuation is continuing on the Calculation Date or any Index Business Day during the Final Measurement Period or during the Repurchase Measurement Period, as applicable, or any other relevant date on which the VWAP Level is to be determined, then the Note Calculation Agent will determine the relevant VWAP Levels using the VWAP and published share weighting of each Index Component included in the Index or successor index, as applicable, immediately prior to such discontinuation or unavailability, as adjusted for certain corporate actions. In such event, the Note Calculation Agent will cause notice thereof to be furnished to the Trustee, to us and to the holders of the Alerian ETNs.

Notwithstanding these alternative arrangements, discontinuation of the publication of the Index or successor index, as applicable, may adversely affect the value of the Alerian ETNs.

If at any time the method of calculating the Index or a successor index, or the value thereof, is changed in a material respect, or if the Index or a successor index is in any other way modified so that the VWAP Level of the Index or such successor index does not, in the opinion of the Note Calculation Agent, fairly represent the VWAP Level of the Index or such successor index had such changes or modifications not been made, then the Note Calculation Agent will make such calculations and adjustments as, in the good faith judgment of the Note Calculation Agent, may be necessary in order to arrive at a VWAP level of an index comparable to the Index or such successor index, as the case may be, as if such changes or modifications had not been made, and the Note Calculation Agent will calculate the VWAP Levels for the Index or such successor index with reference to the Index or such successor index, as adjusted. The Note Calculation Agent will accordingly calculate any values that reference the VWAP Levels based on the relevant VWAP Levels calculated by the Note Calculation Agent, as adjusted. Accordingly, if the method of calculating the Index or a successor index is modified so that the level of the Index or such successor index is a fraction of what it would have been if there had been no such modification (e.g., due to a split in the index), which, in turn, causes the VWAP Level of the Index or such successor index to be a fraction of what it would have been if there had been no such modification, then the Note Calculation Agent will make such

calculations and adjustments in order to arrive at a VWAP Level for the Index or such successor index as if it had not been modified (e.g., as if such split had not occurred).

Payment upon an Event of Default

In case an event of default with respect to the Alerian ETNs shall have occurred and be continuing, the amount declared due and payable per Alerian ETN upon any acceleration of the Alerian ETNs will be determined by the Note Calculation Agent and will be an amount in cash equal to the Repurchase Amount, calculated as if the date of acceleration were the first Index Business Day in the Repurchase Measurement Period and the four Index Business Days immediately succeeding the date of acceleration were the corresponding Index Business Days in the accelerated Repurchase Measurement Period. For purposes of this calculation the Repurchase Fee Amount shall be zero.

If the maturity of the Alerian ETNs is accelerated because of an event of default as described above, we will, or will cause the Note Calculation Agent to, provide written notice to the Trustee at its New York office, on which notice the Trustee may conclusively rely, and to DTC, as holder of the Alerian ETNs, of the cash amount due with respect to the Alerian ETNs as promptly as possible and in no event later than two Business Days after the date of acceleration.

Listing

The Alerian ETNs have been listed on the NYSE Arca under the ticker symbol “AMJ.” No assurance can be given as to the continued listing of the Alerian ETNs for their term or of the liquidity or trading market for the Alerian ETNs.

Book-Entry Only Issuance – The Depository Trust Company

DTC will act as securities depository for the Alerian ETNs. The Alerian ETNs have been issued only as fully registered securities registered in the name of Cede & Co. (DTC's nominee). One or more fully registered global note certificates, representing the total aggregate principal amount of the Alerian ETNs, have been issued and have been deposited with DTC. We will not issue definitive notes in exchange for the global notes except in limited circumstances.

Registrar, Transfer Agent and Paying Agent

The Bank of New York Mellon or one of its affiliates will act as registrar and transfer agent for the Alerian ETNs. The Bank of New York Mellon will also act as paying agent and may designate additional paying agents.

Reissuances or Reopening Issuances

We may in our sole discretion, “reopen” or reissue the Alerian ETNs based upon market conditions and VWAP Levels at that time. These further issuances, if any, will be consolidated to form a single sub-series with the originally issued Alerian ETNs and will have the same CUSIP number and will trade interchangeably with the Alerian ETNs immediately upon settlement. Any Alerian ETNs bearing the same CUSIP number that are issued pursuant to any future additional issuances of Alerian ETNs bearing the same CUSIP number will increase the aggregate principal amount of the outstanding Alerian ETNs. The price of any additional offering will be determined at the time of pricing of that offering.

Certain Defined Terms

Key Defined Terms

A “Business Day” means any day other than a day on which the banking institutions in The City of New York are authorized or required by law, regulation or executive order to close or a day on which transactions in dollars are not conducted.

The “Calculation Date” is May 15, 2024, unless such day is not an Index Business Day, in which case the Calculation Date will be the next Index Business Day, subject to adjustments and subject to postponement in the event of a Market Disruption Event as described under “Market Disruption Events.”

The “Daily Note Value” means, as of any date of determination, an amount per Alerian ETN equal to the product of:

- the Principal Amount; and
- a fraction, the numerator of which is equal to the VWAP Level as of such date and the denominator of which is equal to the Initial VWAP Level.

An “ex-dividend date” means, with respect to a distribution on an Index Component, the first Business Day on which transactions in such Index Component trade on the Primary Exchange without the right to receive such distribution.

An “Exchange Business Day” means any day on which the primary exchange or market for trading of the Alerian ETNs is scheduled to be open for trading.

The “Final Measurement Period” means the five Index Business Days from and including the Calculation Date, subject to adjustments and subject to postponement in the event of a Market Disruption Event as described under “Market Disruption Events.”

The “Final VWAP Level” is the arithmetic mean of the VWAP Levels measured on each Index Business Day in the Final Measurement Period or during any applicable Repurchase Measurement Period, as applicable, as calculated by the VWAP Calculation Agent.

An “Index Business Day” means any day on which each Primary Exchange and each Related Exchange are scheduled to be open for trading.

An “Index Component” means each energy-oriented Master Limited Partnership included in the Index (collectively, the “Index Components”).

The “Index Divisor,” as of any date of determination, is the divisor used by the Index Calculation Agent to calculate the level of the Index.

The “Initial Issue Date,” is April 6, 2009.

The “Initial VWAP Level” is 190.36605, which is the arithmetic mean of the VWAP Levels measured on each Index Business Day during the period from and including March 30, 2009 to and including April 1, 2009, as calculated by the VWAP Calculation Agent.

The “Maturity Date” is May 24, 2024, subject to postponement in the event of a Market Disruption Event as described under “Market Disruption Events.”

A “Primary Exchange” means, with respect to each Index Component, the primary exchange or market of trading of such Index Component.

The “Quarterly Tracking Fee” means, as of any date of determination, an amount per Alerian ETN equal to the product of:

- 0.2125% (equivalent to 0.85% per annum) and
- the Daily Note Value as of the immediately preceding Index Business Day.

A “record date” means, with respect to a distribution on an Index Component, the date on which a holder of the Index Component must be registered as a unitholder of such Index Component in order to be entitled to receive such distribution.

A “Related Exchange” means, with respect to each Index Component, each exchange or quotation system where trading has a material effect (as determined by the Note Calculation Agent) on the overall market for futures or options contracts relating to such Index Component.

Additional Key Coupon Payment Terms

The “Coupon Ex-Date” means, with respect to a Coupon Amount, the first Exchange Business Day on which the Alerian ETNs trade without the right to receive such Coupon Amount. Under current NYSE Arca practice, the Coupon Ex-Date will generally be the Exchange Business Day immediately preceding the applicable Coupon Record Date.

The “Coupon Payment Date” means the 15th Index Business Day following each Coupon Valuation Date, *provided* that the final Coupon Payment Date will be the Maturity Date.

The “Coupon Record Date” means the 9th Index Business Day following each Coupon Valuation Date.

The “Coupon Valuation Date” means the 15th of February, May, August and November of each calendar year during the term of the Alerian ETNs or if such date is not an Index Business Day, then the first Index Business Day following such date, beginning on May 15, 2009, provided that the final Coupon Valuation Date will be the Calculation Date.

The “Reference Distribution Amount” means:

- as of the first Coupon Valuation Date, an amount equal to the gross cash distributions that a Reference Holder would have been entitled to receive in respect of the Index Components held by such Reference Holder on the record date with respect to any Index Component, for those cash distributions whose ex-dividend date occurs during the period from and excluding the Initial Issue Date to and including the first Coupon Valuation Date; and
- as of any other Coupon Valuation Date, an amount equal to the gross cash distributions that a Reference Holder would have been entitled to receive in respect of the Index Components held by such Reference Holder on the record date with respect to any Index Component for those cash distributions whose ex-dividend date occurs during the period from and excluding the immediately preceding Coupon Valuation Date to and including such Coupon Valuation Date.

Notwithstanding the foregoing, with respect to cash distributions for an Index Component which is scheduled to be paid prior to the applicable Coupon Ex-Date, *if, and only if*, the issuer of such Index Component fails to pay the distribution to holders of such Index Component by the scheduled payment date for such distribution, such distribution will be assumed to be zero for the purposes of calculating the applicable Reference Distribution Amount.

The “Reference Holder” means, as of any date of determination, a hypothetical holder of a number of shares of each Index Component equal to:

- the published share weighting of that Index Component as of that date, *divided by*
- the product of:
 - the Index Divisor as of that date, and
 - ten.

Additional Key Early Repurchase Terms

The “Adjusted Coupon Amount” means, with respect to any applicable Repurchase Valuation Date, a coupon payment, if any, in an amount in cash equal to the difference between:

- the Adjusted Reference Distribution Amount, calculated as of the applicable Repurchase Valuation Date; and
- the Adjusted Tracking Fee, calculated as of such Repurchase Valuation Date.

The “Adjusted Reference Distribution Amount” means, as of any applicable Repurchase Valuation Date, an amount equal to the gross cash distributions that a Reference Holder would have been entitled to receive in respect of the Index Components held by such Reference Holder on the record date with respect to any Index Component, for cash distributions with the applicable ex-dividend date occurring during the period from and excluding the immediately preceding Coupon Valuation Date (or if the Repurchase Valuation Date occurs prior to the first Coupon Valuation Date, the period from and excluding the Initial Issue Date) to and including the applicable Repurchase Valuation Date.

The “Adjusted Tracking Fee” means, as of any applicable Repurchase Valuation Date, an amount equal to:

- the Tracking Fee Shortfall as of the immediately preceding Coupon Valuation Date plus
- the product of:
 - the Quarterly Tracking Fee as of such Repurchase Valuation Date; and
 - a fraction, the numerator of which is the total number of calendar days from and excluding the immediately preceding Coupon Valuation Date (or if the Repurchase Valuation Date occurs prior to the first Coupon Valuation Date, the period from and excluding the Initial Issue Date) to and including such Repurchase Valuation Date, and the denominator of which is 90.

The “Repurchase Date” means the third Calculation Date following the last Index Business Day in any applicable Repurchase Measurement Period, subject to postponement in the event of a Market Disruption Event as described under “Market Disruption Events.”

The “Repurchase Fee” is equal to 0.125%.

The “Repurchase Valuation Date” means the last Index Business Day of each week, generally Friday. This day is also the first Index Business Day following the date that the applicable Repurchase Notice and Repurchase Confirmation are delivered. Any applicable Repurchase Valuation Date is subject to adjustments as described under “Market Disruption Events.”

General Terms of the Series E Notes

In this “General Terms of the Series E Notes” section, all references to the “debt securities” refer to Series E Notes issued by JPMorgan Chase.

The following description of the terms of the debt securities contains certain general terms that may apply to the debt securities, including the Alerian ETNs.

We have summarized below the material provisions of the 2001 Indenture and the debt securities issued under the 2001 Indenture. These descriptions are only summaries, and each investor should refer to the 2001 Indenture, which describes completely the terms and definitions summarized below and contains additional information regarding the debt securities issued under it. Where appropriate, we use parentheses to refer you to the particular sections of the 2001 Indenture. Any reference to particular sections or defined terms of the 2001 Indenture in any statement under this heading qualifies the entire statement and incorporates by reference the applicable section or definition into that statement.

The debt securities will be our direct, unsecured general obligations and will have the same rank in liquidation as all of our other unsecured and unsubordinated debt.

We are a holding company and conduct substantially all of our operations through subsidiaries. As a result, claims of the holders of the debt securities will generally have a junior position to claims of creditors of our subsidiaries, except to the extent that JPMorgan Chase & Co. may be recognized, and receives payment, as a creditor of those subsidiaries. Claims of our subsidiaries' creditors other than JPMorgan Chase & Co. include substantial amounts of long-term debt, deposit liabilities, federal funds purchased, securities loaned or sold under repurchase agreements, commercial paper and other borrowed funds.

Events of Default and Waivers

An "Event of Default" with respect to a series of debt securities issued under the 2001 Indenture is defined in the 2001 Indenture as:

- default for 30 days in the payment of interest on any debt securities of that series;
- default in the payment of principal or other amounts payable on any debt securities of that series when due, at maturity, upon redemption, by declaration, or otherwise;
- failure by us for 90 days to perform any other covenants or warranties contained in the 2001 Indenture applicable to that series after written notice has been given by the trustee to us or given by holders of at least 25% in aggregate principal amount of the outstanding securities of all series affected thereby to us and the trustee;
- specified events of our bankruptcy, insolvency, winding up or liquidation, whether voluntary or involuntary; or
- any other event of default provided in the applicable supplemental indentures to the 2001 Indenture or form of security. (Section 5.01)

If a default in the payment of principal, interest or other amounts payable on the debt securities, or a failure in the performance of any covenant or agreement, or any other Event of Default provided in the applicable supplemental indentures to the 2001 Indenture or form of security, with respect to one or more (but in the case of a default in performance of a covenant or agreement, or in a manner provided in a supplemental indenture or form of security, less than all) series of debt securities occurs and is continuing, either the Trustee or the holders of not less than 25% in aggregate principal amount of the debt securities of such series then outstanding, treated as one class, by written notice, may declare the principal of all outstanding debt securities of such series and any interest accrued thereon, to be due and payable immediately. If a default in the performance of any covenant or agreement with respect to all series of debt securities, or in a manner provided in a supplemental indenture or form of security with respect to all series of debt securities, or due to specified events of our bankruptcy, insolvency, winding up or liquidation, occurs and is continuing, either the Trustee or the holders of not less than 25% in aggregate principal amount of all debt securities then outstanding, treated as one class, by written notice, may declare the principal of all outstanding debt securities and any interest accrued thereon, to be due and payable immediately. Subject to certain conditions such declarations may be annulled and past defaults may be waived by the holders of a majority in aggregate principal amount of the outstanding debt securities of the series affected. (Sections 5.01 and 5.10)

An Event of Default with respect to one series of debt securities does not necessarily constitute an Event of Default with respect to any other series of debt securities. The 2001 Indenture requires the Trustee to provide notice of default with respect to the debt securities within 90 days, unless the default is cured, but provides that the Trustee may withhold notice to the holders of the debt securities of any default if the board of directors, the executive committee, or a trust committee of directors or Trustees and/or responsible officers of the Trustee determines in good faith that it is in the interest of the holders of the debt securities of the applicable series to do so. The Trustee may not withhold notice of a default in the payment of principal of, interest on or any other amounts due under, such debt securities. (Section 5.11)

The 2001 Indenture provides that the holders of a majority in aggregate principal amount of outstanding debt securities of each series affected, with all such series voting as a single class, may direct the time, method, and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred on the Trustee. The Trustee may decline to act if the direction is contrary to law and in certain other circumstances set forth in the 2001 Indenture. (Section 5.09) The Trustee is not obligated to exercise any of its rights or powers under the 2001 Indenture at the request or direction of the holders of debt securities unless the holders offer the Trustee security or indemnity satisfactory to it against the costs, expenses and liabilities incurred therein or thereby. (Section 6.02(d))

No holder of any debt security of any affected series has the right to institute any action for remedy unless such holder has previously given to the Trustee written notice of default, the Trustee has failed to take action for 60 days after the holders of not less than 25% in aggregate principal amount of the debt securities of each affected series make written request upon the Trustee to institute such action and have offered reasonable indemnity in connection with the same and the holders of a majority in aggregate principal amount of the debt securities of each affected series (voting as a single class) have not given direction to the Trustee that is inconsistent with the written request referred to above. (Section 5.06)

However, the right of any holder of a debt security or coupon to receive payment of the principal of and interest on that debt security or coupon on or after its due date, or to institute suit for the enforcement of any such payment, may not be impaired or affected without the consent of that holder. (Section 5.07)

The 2001 Indenture requires us to file annually with the Trustee a written statement as to whether or not we have knowledge of a default. (Section 3.05)

Covenant Breach

Under the 2001 Indenture, a “Covenant Breach” would occur with respect to a series of debt securities if we fail to perform or breach any of the covenants contained in the 2001 Indenture (other than a failure to pay principal or interest on the debt securities) and that failure or breach continues for 90 days after the Trustee or the holders of at least 25% in aggregate principal amount of the outstanding debt securities give written notice of that failure or breach. Neither the Trustee nor the holders of the debt securities will be entitled to accelerate the maturity of the debt securities as a result of any Covenant Breach.

If a Covenant Breach or Event of Default with respect to the debt securities occurs and is continuing, the Trustee may in its discretion proceed to protect and enforce its rights and the rights of the holders of the debt securities by such appropriate judicial proceedings as the Trustee deems most effectual to protect and enforce any such rights, whether for the specific enforcement of any covenant or agreement in the 2001 Indenture or in aid of the exercise of any power granted in the 2001 Indenture, or to enforce any other proper remedy.

Modification of the 2001 Indenture

The 2001 Indenture contains provisions permitting us and the Trustee to modify the 2001 Indenture or the rights of the holders of debt securities with the consent of the holders of not less than a majority in aggregate principal amount of each outstanding series of debt securities affected by the modification. Each holder of an affected debt security must consent to a modification that would:

- extend the final maturity date of the principal of, or of any interest on, or other amounts payable under any debt security;
- reduce the principal amount of, rate of interest on, or any other amounts due under any debt security;
- change the currency or currency unit of payment of any debt security or certain provisions of the 2001 Indenture applicable to debt securities in foreign currencies;
- change the method in which amounts of payments of principal, interest or other amounts are determined on any debt security;
- reduce any amount payable upon redemption of any debt security;
- adversely affect the terms on which debt securities are convertible into or exchangeable or payable in other securities, instruments, contracts, currencies, commodities or other forms of property;
- impair the right of a holder to institute suit for the payment of a debt security or, if the debt securities provide, any right of repurchase at the option of the holder of a debt security; or
- reduce the percentage of debt securities of any series, the consent of the holders of which is required for any modification. (Section 8.02)

The 2001 Indenture also permits us and the Trustee to amend the 2001 Indenture in certain circumstances without the consent of the holders of debt securities to evidence our merger or the replacement of the Trustee, to cure any ambiguity or to correct or supplement any defective or inconsistent provision, to make any change to the 2001 Indenture or our debt securities that we deem necessary or desirable and that does not materially and adversely affect the interests of holders of the debt securities and for certain other purposes. (Section 8.01)

Consolidations, Mergers and Sales of Assets

We may not merge or consolidate with any other entity or sell, convey or transfer all or substantially all of our assets to any other entity (other than the sale, conveyance or transfer of all or substantially all of our assets to one or more of our direct or indirect subsidiaries), unless:

- either we are the continuing corporation or the successor entity or the entity to whom those assets are sold, conveyed or transferred is a United States corporation or limited liability company that expressly assumes the due and punctual payment of the principal of, any interest on, or any other amounts due under the debt securities issued under the 2001 Indenture and the due and punctual performance and observance of all the covenants and conditions of the 2001 Indenture binding upon us, and

- we or the successor entity will not, immediately after the merger or consolidation, sale, conveyance or transfer, be in default in the performance of any covenant or condition of the 2001 Indenture binding on us. (Section 9.01)

There are no covenants or other provisions in the 2001 Indenture that would afford holders of debt securities additional protection in the event of a recapitalization transaction, a change of control of JPMorgan Chase & Co. or a highly leveraged transaction. The merger covenant described above would apply only if the recapitalization transaction, change of control or highly leveraged transaction were structured to include a merger or consolidation of JPMorgan Chase & Co. or a sale or conveyance of all or substantially all of our assets. However, we may provide specific protections, such as a put right or increased interest, for particular debt securities, which we would describe in the applicable prospectus supplement.

Concerning the Trustee, Paying Agent, Registrar and Transfer Agent

Our subsidiaries and we have a wide range of banking relationships with Deutsche Bank Trust Company Americas, The Bank of New York Mellon and The Bank of New York Mellon, London Branch. The Bank of New York Mellon and, for notes settled through Euroclear Bank SA/NV or Clearstream Banking, S.A., Luxembourg, The Bank of New York Mellon, London Branch, will be the paying agents, registrars, authenticating agents and transfer agents for debt securities issued under the 2001 Indenture.

Deutsche Bank Trust Company Americas is initially serving as the trustee for other securities issued by us or JPMorgan Financial, including the debt securities issued under the 2001 Indenture, the debt securities issued under JPMorgan Financial's indenture for debt securities, to which we are a guarantor, and the warrants issued under JPMorgan Financial's warrant indenture, to which we are a guarantor. Consequently, if an actual or potential event of default occurs with respect to any of these securities, the Trustee may be considered to have a conflicting interest for purposes of the Trust Indenture Act of 1939, as amended. In that case, the Trustee may be required to resign under the 2001 Indenture, and we would be required to appoint a successor trustee. For this purpose, a "potential" event of default means an event that would be an event of default if the requirements for giving us default notice or for the default having to exist for a specific period of time were disregarded.

Governing Law and Judgments

The debt securities and the 2001 Indenture will be governed by, and construed in accordance with, the laws of the State of New York. (Section 11.08)

DESCRIPTION OF JPMORGAN CHASE FINANCIAL COMPANY LLC'S CALLABLE FIXED RATE NOTES DUE JUNE 10, 2032, FULLY AND UNCONDITIONALLY GUARANTEED BY JPMORGAN CHASE & CO.

The following description of the Callable Fixed Rate Notes due June 10, 2032 (the "Callable Notes") is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to the indenture dated February 19, 2016 (as may be amended or supplemented from time to time, the "2016 Indenture"), among JPMorgan Chase Financial Company LLC, as issuer ("JPMorgan Financial" or the "Issuer"), JPMorgan Chase, as guarantor (the "Guarantor"), and Deutsche Bank Trust Company Americas, as trustee (the "Trustee"), which is incorporated by reference as an Exhibit to the Form 10-K. We encourage you to read the 2016 Indenture for additional information.

General

As of December 31, 2021, \$5,000,000 aggregate principal amount of the Callable Notes were outstanding.

The Callable Notes are unsecured and unsubordinated obligations of JPMorgan Financial, the payment of which is fully and unconditionally guaranteed by JPMorgan Chase & Co. The Callable Notes will rank *pari passu* with all of the Issuer's other unsecured and unsubordinated obligations. JPMorgan Chase & Co.'s guarantee of the Callable Notes will rank *pari passu* with all of JPMorgan Chase & Co.'s other unsecured and unsubordinated obligations. **Any payment on the Callable Notes issued by JPMorgan Financial is subject to the credit risk of JPMorgan Finance Callable Notes, and the credit risk of JPMorgan Chase & Co., as guarantor of the Callable Notes.**

The Callable Notes are part of a series of the Issuer's debt securities entitled "Global Medium-Term Notes, Series A" (the "Series A Notes") that the Issuer may issue under the 2016 Indenture from time to time. For more information about the Series A Notes, please see the section titled "– General Terms of the Series A Notes" below.

The Callable Notes are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or by any other governmental agency, nor are they obligations of, or guaranteed by, a bank.

Unless otherwise specified, references herein to "holders" mean those in whose names the Callable Notes are registered on the books that the Issuer or the Trustee, or any successor trustee, as applicable, maintain for this purpose, and not those who own beneficial interests in the Callable Notes (registered in street name or otherwise).

Key Terms of the Callable Notes

We issued the Callable Notes on June 10, 2021, in minimum denominations of \$1,000 and in integral multiples of \$1,000 thereafter. The Maturity Date of the Callable Notes is June 10, 2032. Interest on the Callable Notes is payable semiannually on June 10th and December 10th of each year, beginning on December 10, 2021 to and including the Maturity Date (each, an “Interest Payment Date”), subject to any earlier redemption, at the Interest Rate of 2.60% per annum.

On June 10, 2031 (the “Redemption Date”), the Issuer may redeem the holders’ Callable Notes, in whole but not in part, at a price equal to the principal amount being redeemed *plus* any accrued and unpaid interest. Any accrued and unpaid interest on the Callable Notes redeemed will be paid to the person who is the holder of record on such Callable Notes at the close of business one (1) business day prior to the Redemption Date. To redeem the Callable Notes, the Issuer will deliver notice to DTC, as holder of the Callable Notes, at least 5 business days and not more than 15 business days prior to the Redemption Date.

Calculation Agent

JPMS (the “Calculation Agent”) will make all necessary calculations and determinations in connection with the Callable Notes, including calculations and determinations relating to any payments on the Callable Notes.

Payment upon an Event of Default

In case an event of default with respect to the Callable Notes shall have occurred and be continuing, the amount declared due and payable per \$1,000 principal amount note upon any acceleration of the Callable Notes will be determined by the Calculation Agent and will be an amount in cash equal to \$1,000 per \$1,000 principal amount note *plus* accrued and unpaid interest, calculated as if the date of acceleration were the Maturity Date. In such case, interest will be calculated on the basis of a 360-day year and the actual number of days in such adjusted Interest Period and will be based on the Interest Rate on the applicable date immediately preceding such adjusted Interest Period.

If the maturity of the Callable Notes is accelerated because of an event of default as described above, the Issuer will, or will cause the Calculation Agent to, provide written notice to the Trustee at its New York office, on which notice the Trustee may conclusively rely, and to DTC of the cash amount due with respect to the Callable Notes as promptly as possible and in no event later than two business days after the date of acceleration.

Listing

The Callable Notes are listed and admitted to trading on the NYSE under the trading symbol “JPM/32.” No assurance can be given as to the continued listing for the term of the Callable Notes, or the liquidity or trading market for the Callable Notes.

Book-Entry Only Issuance – The Depository Trust Company

DTC will act as securities depository for the Callable Notes. The Callable Notes have been issued only as fully registered securities registered in the name of Cede & Co. (DTC’s nominee). One or more fully registered global note certificates, representing the total aggregate principal amount of the Callable Notes, have been issued and have been deposited with DTC. We will not issue definitive notes in exchange for the global notes except in limited circumstances.

Registrar, Transfer Agent and Paying Agent

The Bank of New York Mellon or one of its affiliates will act as registrar and transfer agent for the Callable Notes. The Bank of New York Mellon will also act as paying agent for the Callable Notes and may designate additional paying agents.

Reopening Issuances

The Issuer may, in its sole discretion, “reopen” the Callable Notes based upon market conditions at that time. These further issuances, if any, will be consolidated with, have the same CUSIP number as and trade interchangeably with the respective originally issued Callable Notes immediately upon settlement and, consequently, will increase the aggregate principal amount of such outstanding Callable Notes. The price of any additional offering will be determined at the time of pricing of that offering.

General Terms of the Series A Notes

In this “General Terms of the Series A Notes” section, all references to the “debt securities” refer to Series A Notes issued by JPMorgan Chase Financial Company LLC.

The following description of the terms of the debt securities contains certain general terms that may apply to the debt securities, including the Callable Notes.

We have summarized below the material provisions of the 2016 Indenture and the debt securities and guarantees issued under the 2016 Indenture.

These descriptions are only summaries, and each investor should refer to the 2016 Indenture, which describes completely the terms and definitions summarized below and contains additional information regarding the debt securities issued under it. Where

appropriate, we use parentheses to refer you to the particular sections of the 2016 Indenture. Any reference to particular sections or defined terms of the 2016 Indenture in any statement under this heading qualifies the entire statement and incorporates by reference the applicable section or definition into that statement.

The debt securities will be the Issuer's direct, unsecured general obligations, the payment on which is fully and unconditionally guaranteed by the Guarantor, and will have the same rank in liquidation as all of the Issuer's other unsecured and unsubordinated debt.

The Guarantor is a holding company and conducts substantially all of its operations through subsidiaries. As a result, claims of the holders of the debt securities against the Guarantor under the guarantee will generally have a junior position to claims of creditors of the Guarantor's subsidiaries, except to the extent that the Guarantor may be recognized, and receives payment, as a creditor of those subsidiaries. Claims of the Guarantor's subsidiaries' creditors other than the Guarantor include substantial amounts of long-term debt, deposit liabilities, federal funds purchased, securities loaned or sold under repurchase agreements, commercial paper and other borrowed funds.

Events of Default and Waivers

An "Event of Default" with respect to a series of debt securities issued under the 2016 Indenture is defined in the 2016 Indenture as:

- default in the payment of interest on any debt securities of that series and continuance of such default for 30 days;
- default in the payment of principal or other amounts payable on any debt securities of that series when due, at maturity, upon redemption, by declaration, or otherwise;
- default in the performance, or breach, of any other covenants or warranties applicable to the Issuer contained in the 2016 Indenture applicable to that series, and continuation of such default or breach for 90 days after written notice has been given by the Trustee to the Issuer and the Guarantor or given by holders of at least 25% in aggregate principal amount of the outstanding securities of all series affected thereby to the Issuer, the Guarantor and the Trustee;
- certain events of the Issuer's bankruptcy, insolvency, receivership, winding up or liquidation, whether voluntary or involuntary;
- the guarantee ceases to be in full force and effect, other than in accordance with the 2016 Indenture, or the Guarantor denies or disaffirms its obligations under the guarantee, *provided* that no Event of Default with respect to the guarantee will occur as a result of, or because it is related directly or indirectly to, the insolvency of the Guarantor or the commencement of proceedings under Title 11 of the United States Code, or the appointment of a receiver for the Guarantor under Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, or the Federal Deposit Insurance Corporation having separately repudiated the Guarantee in receivership, or the commencement of or certain other events of the Guarantor's bankruptcy, insolvency, resolution, receivership, winding up or liquidation; or
- any other event of default provided in the applicable supplemental indentures to the 2016 Indenture or form of security. (Section 5.01)

If an Event of Default occurs and is continuing because of a default in the payment of principal, interest or other amounts payable on the debt securities, a failure in the performance, or breach, of any covenant or agreement applicable to the Issuer, the guarantee ceasing to be in full force and effect, or any other event of default provided in the applicable supplemental indentures to the 2016 Indenture or form of security, either the Trustee or the holders of not less than 25% in aggregate principal amount of the debt securities of such series then outstanding, treated as one class, by written notice to the Issuer and the Guarantor, may declare the principal of all outstanding debt securities of such series and any interest accrued thereon, to be due and payable immediately. If a default due to specified events of the Issuer's bankruptcy, insolvency, receivership, winding up or liquidation, occurs and is continuing, the principal of all outstanding debt securities and any interest accrued thereon will automatically, and without any declaration or other action on the part of the Trustee or any holder, become immediately due and payable. Subject to certain conditions such declarations may be annulled and past defaults may be waived by the holders of a majority in aggregate principal amount of the outstanding debt securities of the series affected. (Sections 5.01 and 5.10)

Events of bankruptcy, insolvency, resolution, receivership, winding up or liquidation relating to the Guarantor will not constitute an Event of Default with respect to any series of debt securities. In addition, failure by the Guarantor to perform any of its covenants or warranties (other than a payment default) will not constitute an Event of Default with respect to any series of debt securities. Therefore, events of bankruptcy, resolution, receivership, insolvency, winding up or liquidation relating to the Guarantor (in the absence of any such event occurring with respect to the Issuer) will not permit any of the debt securities to be declared due and payable and the Trustee is not authorized to exercise any remedy against the Issuer or the Guarantor upon the occurrence or continuation of these events with respect to the Guarantor. Instead, even if an event of bankruptcy, insolvency, resolution, receivership, winding up or liquidation relating to the Guarantor has occurred, the Trustee and the holders of debt securities of a series will not be able to declare the relevant debt securities to be immediately due and payable unless there is an Event of Default with respect to that series as described above, such as the Issuer's bankruptcy, insolvency, receivership, winding up or liquidation or

a payment default by the Issuer or the Guarantor on the relevant debt securities. **The value holders receive on any series of debt securities may be significantly less than what holders would have otherwise received had the Issuer's debt securities been declared due and payable immediately or the Trustee been authorized to exercise any remedy against the Issuer or the Guarantor upon the occurrence or continuation of these events with respect to the Guarantor.**

An Event of Default with respect to one series of debt securities does not necessarily constitute an Event of Default with respect to any other series of debt securities. The 2016 Indenture requires the Trustee to provide notice of default with respect to the debt securities within 90 days, unless the default is cured, but provides that the Trustee may withhold notice to the holders of the debt securities of any default if the board of directors, the executive committee, or a trust committee of directors or Trustees and/or responsible officers of the Trustee determines in good faith that it is in the interest of the holders of the debt securities of the applicable series to do so. The Trustee may not withhold notice of a default in the payment of principal of, interest on or any other amounts due under, such debt securities. (Section 5.11)

The 2016 Indenture provides that the holders of a majority in aggregate principal amount of outstanding debt securities of each series affected, with all such series voting as a single class, may direct the time, method, and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred on the Trustee. The Trustee may decline to act if the direction is contrary to law and in certain other circumstances set forth in the 2016 Indenture. (Section 5.09) The Trustee is not obligated to exercise any of its rights or powers under the 2016 Indenture at the request or direction of the holders of debt securities unless the holders offer the Trustee security or indemnity satisfactory to it against the costs, expenses and liabilities incurred therein or thereby. (Section 6.02(d))

No holder of any debt security of any affected series has the right to institute any action for remedy unless such holder has previously given to the Trustee written notice of default, the Trustee has failed to take action for 60 days after the holders of not less than 25% in aggregate principal amount of the debt securities of each affected series make written request upon the Trustee to institute such action and have offered reasonable indemnity in connection with the same and the holders of a majority in aggregate principal amount of the debt securities of each affected series (voting as a single class) have not given direction to the Trustee that is inconsistent with the written request referred to above. (Section 5.06)

However, the right of any holder of a debt security or coupon to receive payment of the principal of and interest on that debt security or coupon on or after its due date, or to institute suit for the enforcement of any such payment, may not be impaired or affected without the consent of that holder. (Section 5.07)

The 2016 Indenture requires the Issuer and the Guarantor to file annually with the Trustee a written statement as to whether or not the Issuer or the Guarantor, as the case may be, has knowledge of a default. (Section 3.05)

Modification of the 2016 Indenture

The 2016 Indenture contains provisions permitting the Issuer, the Guarantor and the Trustee to modify the 2016 Indenture or the rights of the holders of debt securities with the consent of the holders of not less than a majority in aggregate principal amount of each outstanding series of debt securities affected by the modification. Each holder of an affected debt security must consent to a modification that would:

- extend the final maturity date of the principal of, or of any interest on, or other amounts payable under any debt security;
- reduce the principal amount of, rate of interest on, or any other amounts due under any debt security;
- change the currency or currency unit of payment of any debt security or certain provisions of the 2016 Indenture applicable to debt securities in foreign currencies;
- change the method in which amounts of payments of principal, interest or other amounts are determined on any debt security;
- reduce any amount payable upon redemption of any debt security;
- impair the right of a holder to institute suit for the payment of a debt security or, if the debt securities provide, any right of repurchase at the option of the holder of a debt security;
- reduce the percentage of debt securities of any series, the consent of the holders of which is required for any modification; or
- make any change in the guarantee that would adversely affect the holders of the debt securities of such series or release the Guarantor from the guarantee other than pursuant to the terms of the 2016 Indenture. (Section 8.02)

The 2016 Indenture also permits the Issuer, the Guarantor and the Trustee to amend the 2016 Indenture in certain circumstances without the consent of the holders of debt securities to evidence the Issuer's or the Guarantor's merger or the replacement of the Trustee, to cure any ambiguity or to correct or supplement any defective or inconsistent provision, to make any change to the 2016 Indenture or the Issuer's debt securities that the Issuer deems necessary or desirable and that does not materially and adversely affect the interests of holders of the debt securities and for certain other purposes. (Section 8.01)

Consolidations, Mergers, Sales and Transfers of Assets

Neither the Issuer nor the Guarantor may merge or consolidate with any other entity or sell, convey or transfer all or substantially all of their respective assets to any other entity, unless:

- with respect to the Issuer:
 - either the Issuer is the continuing company in the case of a merger or consolidation or the successor entity in the case of a merger or consolidation (including an affiliate of the Guarantor) or the entity to whom those assets are sold, conveyed or transferred in the case of a sale, conveyance or transfer is a United States corporation or limited liability company that expressly assumes the due and punctual payment of the principal of, any interest on, or any other amounts due under the debt securities and the due and punctual performance and observance of all the covenants and conditions of the 2016 Indenture binding upon the Issuer, and
 - no Event of Default and no event which, with notice or lapse of time or both, would become an Event of Default has occurred or would be continuing, immediately after the merger or consolidation, or the sale, conveyance or transfer, and
- with respect to the Guarantor:
 - either the Guarantor is the continuing corporation in the case of a merger or consolidation or the successor corporation in the case of a merger or consolidation or the entity to whom those assets are sold, conveyed or transferred in the case of a sale, conveyance or transfer is a United States corporation that expressly assumes the full and unconditional guarantee of the full and punctual payment of the principal of, any interest on, or any other amounts due under the debt securities and the due and punctual performance and observance of all the covenants and conditions of the 2016 Indenture binding upon the Guarantor, and
 - no Event of Default and no event which, with notice or lapse of time or both, would become an Event of Default has occurred or would be continuing, immediately after the merger or consolidation, or the sale, conveyance or transfer. (Sections 9.01 and 9.02)

Any transfer of material assets of the Guarantor to any other entity that occurs as a result of, or because it is related directly or indirectly to, any proceedings relative to the Guarantor under Title 11 of the United States Code or under a receivership under Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 or under any other applicable federal or state bankruptcy, insolvency, resolution or other similar law will be deemed to be a sale, conveyance or transfer of all or substantially all of the Guarantor's assets.

There are no covenants or other provisions in the 2016 Indenture that would afford holders of debt securities additional protection in the event of a recapitalization transaction involving the Issuer or the Guarantor, a change of control of the Issuer or the Guarantor or a highly leveraged transaction involving the Issuer or the Guarantor. The merger covenant described above would apply only if the recapitalization transaction, change of control or highly leveraged transaction were structured to include a merger or consolidation of the Issuer or the Guarantor or a sale or conveyance of all or substantially all of the Issuer's or the Guarantor's assets. However, the Issuer may provide specific protections, such as a put right or increased interest, for particular debt securities, which the Issuer would describe in the applicable prospectus supplement.

JPMorgan Chase Guarantee

The Guarantor will fully and unconditionally guarantee the full and punctual payment of the principal of, interest on, and all other amounts payable under the debt securities when the same becomes due and payable, whether at maturity, upon redemption, repurchase at the option of the holders of the applicable debt securities or upon acceleration. If for any reason the Issuer does not make any required payment in respect of the Issuer's debt securities when due, the Guarantor will on demand pay the unpaid amount at the same place and in the same manner that applies to payments made by the Issuer under the 2016 Indenture. The guarantee is of payment and not of collection. (Section 14.01)

The Guarantor's obligations under the guarantee are unconditional and absolute. However, (1) the Guarantor will not be liable for any amount of payment that the Issuer is excused from making or any amount in excess of the amount actually due and owing by the Issuer, and (2) any defense or counterclaims available to the Issuer (except those resulting solely from, or on account of, the Issuer's insolvency or the Issuer's status as debtor or subject of a bankruptcy or insolvency proceeding) will also be available to the Guarantor to the same extent as these defense or counterclaims are available to the Issuer, whether or not asserted by the Issuer. (Section 14.02)

Concerning the Trustee, Paying Agent, Registrar and Transfer Agent

We, the Guarantor and certain of their affiliates have a wide range of banking relationships with Deutsche Bank Trust Company Americas, The Bank of New York Mellon and The Bank of New York Mellon, London Branch. The Bank of New York Mellon and, for notes settled through Euroclear Bank SA/NV or Clearstream Banking, S.A., Luxembourg, The Bank of New York Mellon, London

Branch, will be the paying agents, authenticating agents, registrars and transfer agents for debt securities issued under the 2016 Indenture.

Deutsche Bank Trust Company Americas is initially serving as the Trustee for the debt securities issued under our 2016 Indenture, to which JPMorgan Chase acts as a guarantor, the warrants issued under our warrant indenture, to which JPMorgan Chase acts as a guarantor, and the debt securities issued under JPMorgan Chase's indenture. Consequently, if an actual or potential event of default occurs with respect to any of these securities, the Trustee may be considered to have a conflicting interest for purposes of the Trust Indenture Act of 1939, as amended. In that case, the Trustee may be required to resign under the 2016 Indenture, and the Issuer would be required to appoint a successor trustee. For this purpose, a "potential" event of default means an event that would be an event of default if the requirements for giving the Issuer default notice or for the default having to exist for a specific period of time were disregarded.

Governing Law and Judgments

The debt securities and the 2016 Indenture, including the guarantee, will be governed by, and construed in accordance with, the laws of the State of New York. (Section 11.08)

Exhibit 10.20

JPMORGAN CHASE & CO. LONG-TERM INCENTIVE PLAN TERMS AND CONDITIONS OF JANUARY 18, 2022 RESTRICTED STOCK UNIT AWARD OPERATING COMMITTEE

Award Agreement

These terms and conditions are made part of the Award Agreement dated as of January 18, 2022 (“Grant Date”) awarding Restricted Stock Units (“RSUs”) pursuant to the terms of the JPMorgan Chase & Co. Long-Term Incentive Plan (“Plan”). To the extent the terms of the Award Agreement (all references to which will include these terms and conditions) conflict with the Plan, the Plan will govern. The Award Agreement, the Plan and Prospectus supersede any other agreement, whether written or oral, that may have been entered into by the Firm and you relating to this award.

This award was granted on the Grant Date subject to the Award Agreement. **Unless you decline by the deadline and in the manner specified in the Award Agreement, you will have agreed to be bound by these terms and conditions, effective as of the Grant Date.** If you decline the award, it will be cancelled as of the Grant Date.

Capitalized terms that are not defined in “Definitions” below or elsewhere in the Award Agreement will have the same meaning as set forth in the Plan.

JPMorgan Chase & Co. will be referred to throughout the Award Agreement as “JPMorgan Chase” and together with its subsidiaries as the “Firm”.

Form and Purpose of Award

Each RSU represents a non-transferable right to receive one share of Common Stock as of the applicable vesting date as set forth in your Award Agreement.

The purpose of this award is to motivate your future performance for services to be provided during the vesting period and to align your interests with those of the Firm and its shareholders.

Dividend Equivalents

If dividends are paid on Common Stock while RSUs under this award are outstanding, you will be paid an amount equal to the dividend paid on one share of Common Stock, multiplied by the number of RSUs outstanding under this award as of the dividend record date.

Protection-Based Vesting

This award is intended and expected to vest on the vesting date(s), provided that you are continuously employed by the Firm through such vesting date, or you meet the requirements for continued vesting described under the subsections “--Job Elimination”, “--Full Career Eligibility”, “--Government Office” or “--Disability”. However, vesting and the number of RSUs in which you vest are subject to these terms and conditions (including, but not limited to, sections captioned “Recapture Provisions”, “Remedies” and the following protection-based vesting provision).

Up to a total of fifty percent of your award that would otherwise be distributable to you during the vesting period (“At Risk RSUs”) may be cancelled if the Chief Executive Officer of JPMorgan Chase (“CEO”) determines in his or her sole discretion that cancellation of all or portion of the At Risk RSUs is appropriate in light of any one or a combination of the following factors:

- Your performance in relation to the priorities for your position, or the Firm’s performance in relation to the priorities for which you share responsibility as a member of the Operating Committee, have been unsatisfactory for a sustained period of time. Among the factors the CEO may consider in assessing performance are net income, total net revenue, return on equity, earnings per share and capital ratios of the Firm, both on an absolute basis and, as appropriate, relative to peer firms.
- For any calendar year ending during the vesting period, JPMorgan Chase’s annual pre-tax pre-provision income at the Firm level is negative.
- Awards granted to participants in a Line of Business for which you exercise, or during the vesting period exercised, direct or indirect responsibility, were in whole or in part cancelled because the Line of Business did not meet its annual Line of Business Financial Threshold.
- The Firm does not meet the Firmwide Financial Threshold.

In the event that your employment terminates due to “Job Elimination”, “Full Career Eligibility”, “Government Office” or “Disability” thereby entitling you to continued vesting in your award (or potentially acceleration due to satisfaction of the Government Office Requirements), the cancellation circumstances described above will continue to apply to your At Risk RSUs pursuant to the subsection captioned “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”.

Any determination above with respect to protection-based vesting provisions is subject to ratification by the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase (“Committee”). In the case of an award to the CEO, all such determinations shall be made by the Committee and ratified by the Board.

Vesting Period

The period from the Grant Date to the last vesting date is the “vesting period” (see subsections captioned “--Amendment” pursuant to which the Firm may extend the vesting period and “--No Ownership Rights/Other Limitations” pursuant to which the Firm may place restrictions on delivered shares of Common Stock following a vesting date).

Bonus Recoupment

In consideration of the grant of this award, you agree that you are subject to the JPMorgan Chase Bonus Recoupment Policy (or successor policy) as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 2021 and to this award. You can access this policy as currently in effect by clicking the following link to the JPMorgan Chase & Co. Corporate Governance Principles web page and scrolling to the Bonus Recoupment Policy located under the section titled "Other Matters":

<https://about.jpmorganchase.com/about/governance/corporate-governance-principles>

For the avoidance of doubt, nothing in these terms and conditions in any way limits the rights of the Firm under the JPMorgan Chase Bonus Recoupment Policy (or successor policy).

Recapture Provisions (Detrimental Conduct, Risk-Related and Other Recapture Provisions)

Notwithstanding any terms of this Award Agreement to the contrary, JPMorgan Chase reserves the right in its sole discretion to cancel up to 100% of your outstanding RSUs under this award and, to the extent set forth in "Remedies" below, to recover from you up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares of Common Stock previously distributed (including shares withheld for tax purposes) under this award if the Firm in its sole discretion determines that:

- you engaged in conduct detrimental to the Firm insofar as it causes material financial or reputational harm to the Firm or its business activities, or
- this award was based on materially inaccurate performance metrics, whether or not you were responsible for the inaccuracy, or
- this award was based on a material misrepresentation by you, or
- you improperly or with gross negligence failed to identify, raise or assess, in a timely manner and as reasonably expected, risks and/or concerns with respect to risks material to the Firm or its business activities, or
- your employment was terminated for Cause (see section captioned "Definitions" below) or, in the case of a determination after the termination of your employment, that your employment could have been terminated for Cause.

See section captioned "Remedies" for additional information.

Termination of Employment

Except as explicitly set forth below under the subsections captioned "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability" or under the section captioned "Death", any RSUs outstanding under this award will be cancelled effective on the date your employment with the Firm terminates for any reason.

Subject to these terms and conditions (including, but not limited to, sections captioned "Protection-Based Vesting", "Bonus Recoupment", "Recapture Provisions", "Your Obligations" and "Remedies"), you will be eligible to continue to vest (as you otherwise would vest if you were still employed by JPMorgan Chase) with respect to your award in accordance with its terms and conditions following the termination of your employment if one of the following circumstances applies to you:

Job Elimination

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- the Firm terminated your employment because your job was eliminated, and
- after you are notified that your job will be eliminated, you provided such services as requested by the Firm in a cooperative and professional manner, and
- you satisfied the Release/Certification Requirements set forth below.

Full Career Eligibility

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- you voluntarily terminated your employment with the Firm, had completed at least five years of continuous service with the Firm immediately preceding your termination date, and
- the sum of your age and Recognized Service (as defined below) on your date of termination equaled or exceeded 60 and
- you provided at least 180 days advance written notice to the Firm of your intention to voluntarily terminate your employment under this provision, during which notice period you provided such services as requested by the Firm in a cooperative and professional manner and you did not perform any services for any other employer, and
- continued vesting shall be appropriate, which determination shall be made prior to your termination and will be based on your performance and conduct (before and after providing notice), and
- for 36 months from the date of grant of this award you do not either perform services in any capacity (such as an employee, contractor, consultant, advisor, or self-employed individual, whether paid or unpaid) for a Financial Services Company (as defined below) or work in your profession (whether or not for a Financial Services Company); provided that you may work for a government, education or Not-for-Profit Organization (as defined below), and
- you satisfied the Release/Certification Requirements set forth below.

After receipt of such advance written notice, the Firm may choose to have you continue to provide services during such 180-day period as a condition to continued vesting or shorten the length of the 180-day period at the Firm's sole discretion, but to a date no earlier than the date you would otherwise meet the age and service requirements.

Additional advance notice requirements may apply for employees subject to notice period policies (see "Notice Period" below).

Government Office

In the event that you voluntarily terminate your employment with the Firm to accept a Government Office or become a candidate for an elective Government Office, as described at the end of these terms and conditions under the section captioned "Government Office Requirements". See also definition of Government Office in the section captioned "Definitions".

Disability

In the event that

- your employment with the Firm terminates because (i) you are unable to return to work while you are receiving benefits under the JPMorgan Chase Long Term Disability Plan, or for non-U.S. employees, under the equivalent JPMorgan Chase sponsored local country plan (in either case, "LTD Plan"), or (ii) if you are not covered by a LTD Plan, you are unable to return to work due to a long-term disability that would qualify for benefits under the applicable LTD Plan, as determined by the Firm or a third-party designated by the Firm; provided that you (x) request in writing continued vesting due to such disability within 30 days of the date your employment terminates, and (y) provide any requested supporting documentation and (z) receive the Firm's written consent to such treatment, and
- you satisfied the Release/Certification Requirements set forth below.

Release/Certification

To qualify for continued vesting after termination of your employment under any of the foregoing circumstances:

- you must timely execute and deliver a release of claims in favor of the Firm, having such form and terms as the Firm shall specify,
- with respect to "Full Career Eligibility", prior to the termination of your employment, you must confirm with management that you meet the eligibility criteria (including providing at least 180 days advance written notification), advise that you are seeking to be treated as an individual eligible for "Full Career Eligibility", and receive written consent to such continued vesting,
- with respect to "Full Career Eligibility" and "Government Office", it is your responsibility to take the appropriate steps to certify to the Firm prior to each vesting date while the employment restrictions are outstanding, on the authorized form of the Firm, that you have complied with the employment restrictions applicable to you (as described herein) from your date of termination of employment through the applicable vesting date,
- with respect to "Disability", you must satisfy the notice and documentation described above and receive written consent to such continued vesting, and
- in all cases, complied with all other terms of the Award Agreement. (See section captioned "Your Obligations".)

Death

If you die while you are eligible to vest in RSUs under this award, the RSUs will immediately vest and will be distributed in shares of Common Stock (after applicable tax withholding) to your designated beneficiary on file with the Firm's Stock Administration Department, or if no beneficiary has been designated or survives you or if beneficiary designation is not recognized by local legislation, then to your estate. Any shares will be distributed no later than the end of the calendar year immediately following the calendar year which contains your date of death; however, our administrative practice is to register such shares in the name of your beneficiary or estate within 60 days of the Firm's receipt of any required documentation.

Your Obligations

In consideration of the grant of this award, you agree to comply with and be bound by the obligations set forth below next to the subsections captioned "--Non-Solicitation of Employees and Customers", "--Confidential Information", "--Non-Disparagement", "--Cooperation", "--Compliance with Award Agreement" and "--Notice Period."

Non-Solicitation of Employees and Customers

During your employment by the Firm and for the longer of the (i) one year period following the termination of your employment or, (ii) if your award is not cancelled as of your termination date, the three year period from Grant Date, you will not directly or indirectly, whether on your own behalf or on behalf of any other party, without the prior written consent of the Director of Human Resources: (i) solicit, induce or encourage any of the Firm's then current employees to leave the Firm or to apply for employment elsewhere, unless such current employee has received official, written notice that his or her employment will be terminated due to job elimination, (ii) hire any employee or former employee who was employed by the Firm at the date your employment terminated, unless the individual's employment terminated because his or her job was eliminated, or the individual's employment with the Firm has been terminated for more than six months, (iii) to the fullest extent enforceable under applicable law, solicit or induce or attempt to induce to leave the Firm, or divert or attempt to divert from doing business with the Firm, any then current customers, suppliers or other persons or entities that were serviced by you or whose names became known to you by virtue of your employment with the Firm, or otherwise interfere with the relationship between the Firm and such customers, suppliers or other persons or entities. This does not apply to publicly known institutional customers that you service after your employment with the Firm without the use of the Firm's confidential or proprietary information.

These restrictions do not apply to authorized actions you take in the normal course of your employment with the Firm, such as employment decisions with respect to employees you supervise or business referrals in accordance with the Firm's policies.

Confidential Information

You will not, either during your employment with the Firm or thereafter, directly or indirectly (i) use or disclose to anyone any confidential information related to the Firm's business, or (ii) communicate with the press or other media about matters related to the Firm, its customers or employees, including matters and activities relating to your employment, or the employment of others, by the Firm, in the case of either (i) or (ii), except as explicitly permitted by the JPMorgan Chase Code of Conduct and applicable policies or law or legal process. In addition,

following your termination of employment, you will not, without prior written authorization, access the Firm's private and internal information through telephonic, intranet or internet means. "Confidential information" shall have the same meaning for the Award Agreement as it has in the JPMorgan Chase Code of Conduct.

Nothing in this award precludes you from reporting to the Firm's management or directors, the government, a regulator, a self-regulatory agency, your attorneys or a court, conduct you believe to be in violation of the law or concerns of any known or suspected Code of Conduct violation. It is also not intended to prevent you from responding truthfully to questions or requests from the government, a regulator or in a court of law.

Non-Disparagement

You will not, either during your employment with the Firm or thereafter, make or encourage others to make any public statement or release any information in verbal, written, electronic or any other form, that is intended to, or reasonably could be foreseen to, disparage, embarrass or criticize the Firm or its employees, officers, directors or shareholders as a group. This shall not preclude you from reporting to the Firm's management or directors or to the government or a regulator conduct you believe to be in violation of the law or the Firm's Code of Conduct or responding truthfully to questions or requests for information to the government, a regulator or in a court of law in connection with a legal or regulatory investigation or proceeding.

Cooperation

You will cooperate fully with and provide full and accurate information to the Firm and its counsel with respect to any matter (including any audit, tax proceeding, litigation, investigation or governmental proceeding) with respect to which you may have knowledge or information, subject to reimbursement for actual, appropriate and reasonable out-of-pocket expenses incurred by you.

Compliance with Award Agreement

You will provide the Firm with any information reasonably requested to determine compliance with the Award Agreement, and you authorize the Firm to disclose the terms of the Award Agreement to any third party who might be affected thereby, including your prospective employer.

Notice Period

If you are subject to a notice period or become subject to a notice period after the Grant Date, whether by contract or by policy, that requires you to provide advance written notice of your intention to terminate your employment ("Notice Period"), then as consideration for this award and continued employment, you will provide the Firm with the necessary advance written notice that applies to you, as specified by such contract or policy.

After receipt of your notice, the Firm may choose to have you continue to provide services during the applicable Notice Period or may place you on a paid leave for all or part of the applicable Notice Period. During the Notice Period, you shall continue to devote your full time and loyalty to the Firm by providing services in a cooperative and professional manner and not perform any services for any other employer and shall receive your base salary and certain benefits until your employment terminates. You and the Firm may mutually agree to waive or modify the length of the Notice Period.

Regardless of whether a Notice Period applies to you, you must comply with the 180-day advance notice period described under the subsection captioned "--Full Career Eligibility" in the event you wish to terminate employment under that same subsection.

Remedies

Cancellation

In addition to the cancellation provisions described under the sections captioned "Protection-Based Vesting", "Bonus Recoupment", "Recapture Provisions" and "Termination of Employment", your outstanding RSUs under this award may be cancelled if the Firm in its sole discretion determines that:

- you have failed to comply with any of the advance notice/cooperation requirements or employment restrictions applicable to your termination of employment, or
- you have failed to return the required forms specified under the section captioned "Release/Certification" by the specified deadline, or
- you have violated any of the provisions as set forth above in the section captioned "Your Obligations".

To the extent provided under the subsection captioned "--Amendment" below, JPMorgan Chase reserves the right to suspend vesting of this award and/or distribution of shares under this award, including, without limitation, during any period that JPMorgan Chase is evaluating whether this award is subject to cancellation and/or recovery and/or whether the conditions for distributions of shares under this award are satisfied. JPMorgan Chase is not responsible for any price fluctuations during any period of suspension and, if applicable, suspended units will be reinstated consistent with Plan administration procedures. See also subsection captioned "--No Ownership Rights/Other Limitations".

Recovery

In addition, you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares of Common Stock previously distributed under this award as follows:

- Payment may be required with respect to any shares of Common Stock distributed within the three year period prior to a notice-of-recovery under this section, if the Firm in its sole discretion determines that:

- you committed a fraudulent act, or engaged in knowing and willful misconduct related to your employment, or
 - you violated any of the provisions as set forth above in the section captioned “Your Obligations”, or
 - you violated the employment restrictions set forth in the subsection “--Full Career Eligibility” or “--Government Office” following the termination of your employment.
- In addition, payment may be required with respect to any shares distributed within the one year period prior to notice-of-recovery under this section, if the Firm in its sole discretion determines appropriate pursuant to the provisions in the section captioned “Recapture Provisions”.

Notice-of-recovery under this subsection is a written (including electronic) notice from the Firm to you either requiring payment under this subsection or stating that JPMorgan Chase is evaluating requiring payment under this subsection. Without limiting the foregoing, notice-of-recovery will be deemed provided if the Firm makes a good faith attempt to provide written (including electronic) notice at your last known address maintained in the Firm’s employment records. For the avoidance of doubt, a notice-of-recovery that the Firm is evaluating requiring payment under this subsection shall preserve JPMorgan Chase’s rights to require payment as set forth above in all respects and the Firm shall be under no obligation to complete its evaluation other than as the Firm may determine in its sole discretion.

For purposes of this subsection, shares distributed under this award include shares withheld for tax purposes. However, it is the Firm’s intention that you only be required to pay the amounts under this subsection with respect to shares that are or may be retained by you following a determination of tax liability and that you will not be required to pay amounts with respect to shares representing irrevocable tax withholdings or tax payments previously made (whether by you or the Firm) that you will not be able to recover, recapture or reclaim (including as a tax credit, refund or other benefit). Accordingly, JPMorgan Chase will not require you to pay any amount that the Firm or its nominee in his or her sole discretion determines is represented by such withholdings or tax payments.

Payment may be made in shares of Common Stock or in cash. You agree that any repayment will be a lawful recovery under the terms and conditions of your Award Agreement and is not to be construed in any manner as a penalty.

Nothing in the section in any way limits your obligations under “Bonus Recoupment”.

Right to an Injunction

You acknowledge that a violation or attempted violation of the obligations set forth herein will cause immediate and irreparable damage to the Firm, and therefore agree that the Firm shall be entitled as a matter of right to an injunction, from any court of competent jurisdiction, restraining any violation or further violation of such obligations; such right to an injunction, however, shall be cumulative and in addition to whatever other remedies the Firm may have under law or equity.

Administrative Provisions

Withholding Taxes: As a result of legal and/or tax obligations the Firm, in its sole discretion, may (i) retain from each distribution the number of shares of Common Stock required to satisfy applicable tax obligations or (ii) implement any other desirable or necessary procedures, so that appropriate withholding and other taxes are paid to the competent authorities with respect to the vested shares, dividend equivalents and the award. This may include but is not limited to (i) a market sale of a number of such shares on your behalf substantially equal to the withholding or other taxes, (ii) to the extent required by law, withhold from cash compensation, an amount equal to any withholding obligation with respect to the award, shares that vest under this award, and/or dividend equivalents, and (iii) retaining shares that vest under this award or dividend equivalents until you pay any taxes associated with the award, vested shares and/or the dividend equivalents directly to the competent authorities.

Right to Set Off: Although the Firm expects to settle this award in share(s) of Common Stock as of the applicable vesting date, as set forth in your Award Agreement, the Firm may, to the maximum extent permitted by applicable law (including Section 409A of the Code to the extent it is applicable to you), retain for itself funds or the Common Stock resulting from any vesting of this award to satisfy any obligation or debt that you owe to the Firm. Notwithstanding any account agreement with the Firm to the contrary, the Firm will not recoup or recover any amount owed from any funds or unrestricted securities held in your name and maintained at the Firm pursuant to such account agreement to satisfy any obligation or debt owed by you under this award without your consent. This restriction on the Firm does not apply to accounts described and authorized in “No Ownership Rights/Other Limitations” described below.

No Ownership Rights/Other Limitations: RSUs do not convey the rights of ownership of Common Stock and do not carry voting rights. No shares of Common Stock will be issued to you until after the RSUs have vested. Shares will be issued in accordance with JPMorgan Chase’s procedures for issuing stock. By accepting this award, you authorize the Firm, in its sole discretion, to establish on your behalf a brokerage account in your name with the Firm or book-entry account with our stock plan administrator and/or transfer agent and deliver to that account any vested shares derived from the award. You also acknowledge that should there be a determination that the cancellation provisions of this award apply during the period when the vesting of any outstanding RSUs has been suspended, then you agree that such RSUs may be cancelled in whole or part. (See Sections captioned “Protection-Based Vesting”, “Bonus Recoupment”, “Recapture Provisions”, “Termination of Employment” and “Remedies”, as well as the subsection captioned “--Amendment” permitting suspension of vesting.)

With respect to any applicable vesting date, JPMorgan Chase may impose for any reason, as of such vesting date for such period as it may specify in its sole discretion, such restrictions on the Common Stock to be issued to you as it may deem appropriate, including, but not limited to, restricting the sale, transfer, pledging, assignment, hedging or encumbrance of such shares of Common Stock. Such restrictions described in the last sentence shall not impact your right to vote or receive dividends with respect to the Common Stock. By accepting this award, you acknowledge that during such specified period should there be a determination that the recovery provisions of this award apply, then you agree that you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares subject to such restrictions (notwithstanding the limitation set forth in the “Right to Set Off” subsection above). (See Sections captioned “Bonus Recoupment” and “Remedies”.)

Binding Agreement: The Award Agreement will be binding upon any successor in interest to JPMorgan Chase, by merger or otherwise.

Not a Contract of Employment: Nothing contained in the Award Agreement constitutes a contract of employment or continued employment. Employment is “at-will” and may be terminated by either you or JPMorgan Chase for any reason at any time. This award does not confer any right or entitlement to, nor does the award impose any obligation on the Firm to provide, the same or any similar award in the future and its value is not compensation for purposes of determining severance.

Section 409A Compliance: To the extent that Section 409A of the Code is applicable to this award, distributions of shares and cash hereunder are intended to comply with Section 409A of the Code, and the Award Agreement, including these terms and conditions, shall be interpreted in a manner consistent with such intent.

Notwithstanding anything herein to the contrary, if you (i) are subject to taxation under the Code, (ii) are a specified employee as defined in the JPMorgan Chase 2005 Deferred Compensation Plan and (iii) have incurred a separation from service (as defined in that Plan with the exception of death) and if any units/shares under this award represent deferred compensation as defined in Section 409A and such shares are distributable (under the terms of this award) within six months following, and as a result of your separation from service, then those shares will be delivered to you during the first calendar month after the expiration of six full months from date of your separation from service. Further, if your award is not subject to a substantial risk of forfeiture as defined by regulations issued under Section 409A of the Code, then the remainder of each calendar year immediately following (i) each applicable vesting date set forth in your Award Agreement shall be a payment date for purposes of distributing the vested portion of the award and (ii) each date that JPMorgan Chase specifies for payment of dividends declared on its Common Stock, shall be the payment date(s) for purposes of distributing dividend equivalent payments.

Change in Outstanding Shares: In the event of any change in the outstanding shares of Common Stock by reason of any stock dividend or split, recapitalization, issuance of a new class of common stock, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to stockholders of Common Stock other than regular cash dividends, the Committee will make an equitable substitution or proportionate adjustment, in the number or kind of shares of Common Stock or other securities issued or reserved for issuance pursuant to the Plan and to any RSUs outstanding under this award for such corporate events.

Interpretation/Administration: The Committee has sole and complete authority to interpret and administer this Award Agreement, including, without limitation, the power to (i) interpret the Plan and the terms of this Award Agreement; (ii) determine the reason for termination of employment; (iii) determine application of the post-employment obligations and cancellation and recovery provisions; (iv) decide all claims arising with respect to this award; and (v) delegate such authority as it deems appropriate. Any determination contemplated hereunder by the Committee, the Firm, the Director of Human Resources or their respective delegates or nominees shall be binding on all parties.

Notwithstanding anything herein to the contrary, the determinations of the Director of Human Resources, the Firm, the Committee and their respective delegates and nominees under the Plan and the Award Agreements are not required to be uniform. By way of clarification, the Committee, the Firm, the Director of Human Resources and their respective delegates and nominees shall be entitled to make non-uniform and selective determinations and modifications under Award Agreements and the Plan.

Amendment: The Committee or its nominee reserves the right to amend this Award Agreement in any manner, at any time and for any reason; provided, however, that no such amendment shall materially adversely affect your rights under this Award Agreement without your consent except to the extent that the Committee or its delegate considers advisable to (x) comply with applicable laws or changes in or interpretation of applicable laws, regulatory requirements and accounting rules or standards and/or (y) make a change in a scheduled vesting date or impose the restrictions described above under “No Ownership Rights/Other Limitations”, in either case, to the extent permitted by Section 409A of the Code if it is applicable to you. This Award Agreement may not be amended except in writing signed by the Director of Human Resources of JPMorgan Chase.

Severability: If any portion of the Award Agreement is determined by the Firm to be unenforceable in any jurisdiction, any court or arbitrator of competent jurisdiction or the Director of Human Resources may reform the relevant provisions (e.g., as to length of service, time, geographical area or scope) to the extent the Firm (or court/arbitrator) considers necessary to make the provision enforceable under applicable law.

Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity: Upon receipt of satisfactory evidence that applicable United States federal, state, local, foreign or supranational ethics or conflict of interest laws or regulations require you to divest your interest in JPMorgan Chase RSUs, the Firm may accelerate the distribution of all or part of your outstanding award effective on or before the required divestiture date; provided that no accelerated distribution shall occur if the Firm determines that such acceleration will violate Section 409A of the Code. Accelerated distribution under this paragraph does not impact the dates as set forth in the “Recovery” section above. The time period for recovery shall be determined by the originally scheduled vesting date or distribution date prior to any acceleration event.

If you have voluntarily terminated your employment and have satisfied the requirements of the section captioned “Government Office Requirements”, acceleration shall apply (to extent required) to the percentage of your outstanding award that would continue to vest under that section. In the case of a termination of employment where the award is outstanding as a result of the subsections entitled “--Job Elimination” or “--Full Career Eligibility”, then acceleration shall apply, to the extent required, to the full outstanding award.

Notwithstanding accelerated distribution pursuant to the foregoing, you will remain subject to the applicable terms of your Award Agreement as if your award had remained outstanding for the duration of the original vesting period and shares had been distributed as scheduled as of each applicable vesting date, including, but not limited to, repayment obligations set forth in the section captioned “Remedies” and the employment restrictions in the sections captioned “Protection-Based Vesting” and “Government Office Requirements” and the subsection “--Full Career Eligibility”.

Use of Personal Data: By accepting this award, you acknowledge that the Firm may process your personal data for the purposes of providing you this award (to include registration of shares and units or establishing a brokerage account on your behalf) and disclosing to third parties, such as service providers or tax and regulatory authorities (e.g., for compensation reporting and payroll tax withholding purposes). Additionally, you agree that the Firm may transfer your personal data to jurisdictions that do not afford protections equivalent to the protections in the country in which we collected your data. Where applicable law provides a right to terminate the foregoing authorization, you may do so at any time, except with respect to tax and regulatory reporting and the Firm’s legal and regulatory obligations. In the event you terminate this authorization, your award will be cancelled.

Governing Law: This award shall be governed by and construed in accordance with the laws of the State of New York, without regard to conflicts of law principles.

Choice of Forum: By accepting this award under the Plan, you agree (and have agreed) that to the extent not otherwise subject to arbitration under an arbitration agreement between you and the Firm, any dispute arising directly or indirectly in connection with this award or the Plan shall be submitted to arbitration in accordance with the rules of the American Arbitration Association if so elected by the Firm in its sole discretion. In the event such a dispute is not subject to arbitration for any reason, you agree to accept the exclusive jurisdiction and venue of the United States District Court for the Southern District of New York with respect to any judicial proceeding in connection with this award or the Plan. You waive, to the fullest extent permitted by law, any objection to personal jurisdiction or to the laying of venue of such dispute and further agree not to commence any action arising out of or relating to this award or the Plan in any other forum.

Waiver of Jury Trial/Class Claims: By accepting this award, you agree, with respect to any claim brought in connection with your employment with the Firm in any forum (i) to waive the right to a jury trial and (ii) that any judicial proceeding or arbitration claim will be brought on an individual basis, and you hereby waive any right to submit, initiate, or participate in a representative capacity or as a plaintiff, claimant or member in a class action, collective action, or other representative or joint action.

Litigation: By accepting any award under the Plan, you agree (and have agreed) that in any action or proceeding by the Firm (other than a derivative suit in the right of the Firm) to enforce the terms and conditions of this Award Agreement or any other Award Agreement where the Firm is the prevailing party, the Firm shall be entitled to recover from you its reasonable attorney fees and expenses incurred in such action or proceeding. In addition, you agree that you are not entitled to, and agree not to seek, advancement of attorney fees and indemnification under the Firm's By-Laws in the event of such a suit by the Firm.

Non-transferability: Neither this award or any other outstanding awards of RSUs, nor your interests or rights in any such awards, shall be assigned, pledged, transferred, hedged, hypothecated or subject to any lien. An award may be transferred following your death by will, the laws of descent or by a beneficiary designation on file with the Firm.

Outstanding Awards: The Administrative provisions set forth above shall apply to any award of RSUs outstanding as of the date hereof, and such awards are hereby amended.

Definitions

"Cause" means a determination by the Firm that your employment terminated as a result of your (i) violation of any law, rule or regulation (including rules of self-regulatory bodies) related to the Firm's business, (ii) indictment or conviction of a felony, (iii) commission of a fraudulent act, (iv) violation of the JPMorgan Chase Code of Conduct or other Firm policies or misconduct related to your duties to the Firm (other than immaterial and inadvertent violations or misconduct), (v) grossly inadequate performance of the duties associated with your position or job function or failure to follow reasonable directives of your manager, or (vi) any act or failure to act that is injurious to the interests of the Firm or its relationship with a customer, client or an employee.

"Financial Services Company" means a business enterprise that engages in any of the following services (itself or through an affiliate or subsidiary), regardless of whether such services are the principle strategy or revenue-generating activity:

- commercial or retail banking, including, but not limited to, commercial, institutional and personal trust, custody and/or lending and processing services, internet banking, originating and servicing mortgages, issuing and servicing credit cards, payment servicing or processing or merchant services,
- insurance, including but not limited to, guaranteeing against loss, harm, damage, illness, disability or death, providing and issuing annuities, acting as principal, agent or broker for purpose of the forgoing,
- financial, investment or economic advisory services, including but not limited to, investment banking services (such as advising on mergers or dispositions, underwriting, dealing in, or making a market in securities or other similar activities), brokerage services, investment management services, asset management services, foreign exchange services, interbank networks and hedge funds,
- issuing, trading or selling instruments representing interests in pools of assets or in derivatives instruments,
- financial technology companies, such as those selling blockchain services, or offering or selling financial products/services,
- advising on, or investing in, private equity or real estate funds or ventures, or
- any similar activities that the Director of Human Resources or nominee determines in his or her sole discretion constitute financial services.

"Firmwide Financial Threshold" means a cumulative return on tangible common equity for calendar years 2022, 2023 and 2024 of not less than 15%. Cumulative return on tangible common equity means (i) the sum of the Firm's reported net income for all three calendar years, divided by (ii) reported year-end tangible equity averaged over the three years.

"Government Office" means (i) a full-time position in an elected or appointed office in local, state, or federal government (including equivalent positions outside the U.S. or in a supranational organization), not reasonably anticipated to be a full-career position, or (ii) conducting a bona fide full-time campaign for such an elective public office after formally filing for candidacy, where it is customary and reasonably necessary to campaign full-time for the office.

"Line of Business" means a business unit of the Firm (or one or more business units designated below under the definition "Line of Business Financial Threshold" of the Corporate Investment Bank). All Corporate Functions (including the functions of the Chief Investment Office) are considered a single Line of Business.

Asset & Wealth Management	Annual negative pre-tax pre-provision income ¹
Card and Auto	Annual negative pre-tax pre-loan loss reserve income ²
Commercial Banking	Annual negative pre-tax pre-loan loss reserve income ²

Corporate Investment Bank	Annual negative pre-tax pre-provision income ¹ for CIB overall or annual negative allocated product revenues (excluding XVA) for: <ul style="list-style-type: none"> • Fixed Income • Equities • Securities Services • Global Investment Banking • Payments
Consumer Banking, U.S. Wealth Management and Business Banking	Annual negative pre-tax pre-loan loss reserve income ²
Corporate Functions (including Chief Investment Office)	Annual negative pre-tax pre-provision income ¹ at the Firm level
Home Lending	Annual negative pre-tax pre-loan loss reserve income ²
¹ Pre-tax pre-provision income means Revenue less Expenses	
² Pre-tax pre-loan loss reserve income means Revenue less (Expenses plus Net Charge-offs)	

“Not-for-Profit Organization” means an entity exempt from tax under state law and under Section 501(c)(3) of the Code. Section 501(c)(3) only includes entities organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals. Not-for-Profit Organization shall also mean entities outside the United States exempt from local and national tax laws because they are organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals.

“Recognized Service” means the period of service as an employee set forth in the Firm’s applicable service-related policies.

Government Office Requirements

You may be eligible to continue vesting in all or part of your award if you voluntarily resign to accept a Government Office (as defined above) or to become a candidate for an elective Government Office.

Full Career Eligibility:

“Government Office Requirements” does not apply to you if you satisfy the subsection captioned “--Full Career Eligibility” as of the date that you voluntarily terminate your employment with the Firm.

Eligibility:

Eligibility for continued vesting is conditioned on your providing the Firm:

- At least 60 days’ advance written notice of your intention to resign to accept or pursue a Government Office (see section captioned “Definitions”), during which period you must perform in a cooperative and professional manner services requested by the Firm and not provide services for any other employer. The Firm may elect to shorten this notice period at the Firm’s sole discretion.
- Confirmation, in a form of satisfactory to the firm, that vesting in this award pursuant to this provision would not violate any applicable law, regulation or rule.
- Documentation in a form satisfactory to the Firm that your resignation is for the purpose of accepting a Government Office or becoming a candidate for a Government Office. (See Section captioned “Definitions”.)

Portion of Your Awards Subject to Continued Vesting:

Subject to the conditions below, the percentage of your outstanding awards that will continue to vest in accordance with this award’s original schedule will be based on your years of continuous service completed with the Firm immediately preceding your termination date, as follows:

- 50% if you have at least 3 but less than 4 years of continuous service,
- 75% if you have at least 4 but less than 5 years of continuous service, or
- 100% if you have 5 or more years of continuous service.

The portion of each award subject to continued vesting above is referred to as the “CV Award” and the portion not subject to continued vesting will be cancelled on the date your employment terminates.

Conditions for Continued Vesting of Awards:

- You must remain in a non-elective Government Office for two or more years after your employment with the Firm terminates to receive in full your CV Award; provided that if your non-elective Government Office is for a period less than two years, you will be entitled to retain any portion of the CV Award with a vesting date during your period of Government Service; or
- In the case of resignation from the Firm to campaign for an elective Government Office, your name must be on the primary or final public ballot for the election. (If you are not elected, see below for employment restrictions.)

Satisfaction of Conditions:

If your service in a Government Office ends two years or more after your employment with the Firm terminates, or in the case of resignation from the Firm to campaign for a Government Office, your name is on the primary or final public ballot for the election and you are not elected, any CV Awards then outstanding and any such awards that would have then been outstanding but for an accelerated distribution of shares (as described in the subsection captioned “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”) will be subject for the remainder of the applicable vesting period to the same terms and conditions of this Award Agreement, including employment restrictions during the vesting period, as if you had resigned from the Firm having met the requirements for Full Career Eligibility.

Failure to Satisfy Conditions:

If you do not satisfy the above “Conditions for Continued Vesting of Awards”, any outstanding RSUs under each CV Award will be cancelled. You also will be required to repay the Fair Market Value of the number of shares (before tax and other withholdings) of Common Stock distributed to you that would have been outstanding as RSUs on the date you failed to satisfy the “Condition for Continued Vesting of Awards” but for their accelerated distribution (as described in the subsection captioned “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”). Fair Market Value for this purpose will be determined as the date that the shares were distributed.

**JPMORGAN CHASE & CO. LONG-TERM INCENTIVE PLAN
TERMS AND CONDITIONS OF JANUARY 18, 2022
RESTRICTED STOCK UNIT AWARD
OPERATING COMMITTEE**

Award Agreement

These terms and conditions are made part of the Award Agreement dated as of January 18, 2022 (“Grant Date”) awarding Restricted Stock Units (“RSUs”) pursuant to the terms of the JPMorgan Chase & Co. Long-Term Incentive Plan (“Plan”). To the extent the terms of the Award Agreement (all references to which will include these terms and conditions) conflict with the Plan, the Plan will govern. The Award Agreement, the Plan and Prospectus supersede any other agreement, whether written or oral, that may have been entered into by the Firm and you relating to this award.

This award was granted on the Grant Date subject to the Award Agreement. **Unless you decline by the deadline and in the manner specified in the Award Agreement, you will have agreed to be bound by these terms and conditions, effective as of the Grant Date.** If you decline the award, it will be cancelled as of the Grant Date.

Capitalized terms that are not defined in “Definitions” below or elsewhere in the Award Agreement will have the same meaning as set forth in the Plan.

JPMorgan Chase & Co. will be referred to throughout the Award Agreement as “JPMorgan Chase” and together with its subsidiaries as the “Firm”.

Form and Purpose of Award

Each RSU represents a non-transferable right to receive one share of Common Stock as of the applicable vesting date as set forth in your Award Agreement.

The purpose of this award is to motivate your future performance for services to be provided during the vesting period and to align your interests with those of the Firm and its shareholders.

Dividend Equivalents

This award is not eligible for dividend equivalent payments.

Protection-Based Vesting

This award is intended and expected to vest on the vesting date(s), provided that you are continuously employed by the Firm through such vesting date, or you meet the requirements for continued vesting described under the subsections “--Job Elimination”, “--Full Career Eligibility”, “--Government Office” or “--Disability”. However, vesting and the number of RSUs in which you vest are subject to these terms and conditions (including, but not limited to, sections captioned “Recapture Provisions”, “Remedies” and the following protection-based vesting provision).

Up to a total of fifty percent of your award that would otherwise be distributable to you during the vesting period (“At Risk RSUs”) may be cancelled if the Chief Executive Officer of JPMorgan Chase (“CEO”) determines in his or her sole discretion that cancellation of all or portion of the At Risk RSUs is appropriate in light of any one or a combination of the following factors:

- Your performance in relation to the priorities for your position, or the Firm’s performance in relation to the priorities for which you share responsibility as a member of the Operating Committee, have been unsatisfactory for a sustained period of time. Among the factors the CEO may consider in assessing performance are net income, total net revenue, return on equity, earnings per share and capital ratios of the Firm, both on an absolute basis and, as appropriate, relative to peer firms.
- For any calendar year ending during the vesting period, JPMorgan Chase’s annual pre-tax pre-provision income at the Firm level is negative.
- Awards granted to participants in a Line of Business for which you exercise, or during the vesting period exercised, direct or indirect responsibility, were in whole or in part cancelled because the Line of Business did not meet its annual Line of Business Financial Threshold.
- The Firm does not meet the Firmwide Financial Threshold.

In the event that your employment terminates due to “Job Elimination”, “Full Career Eligibility”, “Government Office” or “Disability” thereby entitling you to continued vesting in your award (or potentially acceleration due to satisfaction of the Government Office Requirements), the cancellation circumstances described above will continue to apply to your At Risk RSUs pursuant to the subsection captioned “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”.

Any determination above with respect to protection-based vesting provisions is subject to ratification by the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase (“Committee”). In the case of an award to the CEO, all such determinations shall be made by the Committee and ratified by the Board.

Vesting Period

The period from the Grant Date to the last vesting date is the “vesting period” (see subsections captioned “--Amendment” pursuant to which the Firm may extend the vesting period and “--No Ownership Rights/Other Limitations” pursuant to which the Firm may place restrictions on delivered shares of Common Stock following a vesting date).

Holding Requirement

As of each vesting date, you shall be entitled to a distribution equal to the Fair Market Value of the number of RSUs vesting on such date, less the number being withheld to satisfy tax withholding obligations. You agree that the distribution made to you will be held in an account in your name with restrictions preventing you from transferring, assigning, hedging, selling, pledging or otherwise encumbering such distribution for a twelve month period commencing with the vesting date. Such restrictions shall lapse in event of your death.

Bonus Recoupment

In consideration of the grant of this award, you agree that you are subject to the JPMorgan Chase Bonus Recoupment Policy (or successor policy) as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 2021 and to this award. You can access this policy as currently in effect by clicking the following link to the JPMorgan Chase & Co. Corporate Governance Principles web page and scrolling to the Bonus Recoupment Policy located under the section titled “Other Matters”:

<https://about.jpmorganchase.com/about/governance/corporate-governance-principles>

For the avoidance of doubt, nothing in these terms and conditions in any way limits the rights of the Firm under the JPMorgan Chase Bonus Recoupment Policy (or successor policy).

EMEA Malus and Clawback Policy - Identified Staff

In consideration of grant of this award, and without prejudice to any other provision of this Award Agreement, you agree that you are subject to the JPMorgan Chase EMEA Malus and Clawback Policy - Identified Staff (and any applicable supplement(s) to that policy) or successor policy as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 2021 and to this award.

The provisions of the JPMorgan Chase EMEA Malus and Clawback Policy - Identified Staff set out the terms and conditions applying to the grant of this award which ensure that the Firm is able to meet its regulatory obligations to operate malus (reduce) and/or clawback (recover) to awards in certain circumstances. These include, but are not limited to, where (i) there is a material downturn in the Firm’s financial performance or (ii) where the Firm is required to hold more capital. The circumstances in which the events at (i) and (ii) would occur are analogous to some of the circumstances considered under the existing Firmwide terms and conditions, in particular the Bonus Recoupment Policy and the Protection Based Vesting provisions. You can access this policy as currently in effect in My Rewards through the following link: <https://myrewards.jpmorganchase.com>

Recapture Provisions (Detrimental Conduct, Risk-Related and Other Recapture Provisions)

Notwithstanding any terms of this Award Agreement to the contrary, JPMorgan Chase reserves the right in its sole discretion to cancel up to 100% of your outstanding RSUs under this award and, to the extent set forth in “Remedies” below, to recover from you up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares of Common Stock previously distributed (including shares withheld for tax purposes) under this award if the Firm in its sole discretion determines that:

- you engaged in conduct detrimental to the Firm insofar as it causes material financial or reputational harm to the Firm or its business activities, or
- this award was based on materially inaccurate performance metrics, whether or not you were responsible for the inaccuracy, or
- this award was based on a material misrepresentation by you, or
- you improperly or with gross negligence failed to identify, raise or assess, in a timely manner and as reasonably expected, risks and/or concerns with respect to risks material to the Firm or its business activities, or
- your employment was terminated for Cause (see section captioned “Definitions” below) or, in the case of a determination after the termination of your employment, that your employment could have been terminated for Cause.

See section captioned “Remedies” for additional information.

Termination of Employment

Except as explicitly set forth below under the subsections captioned “--Job Elimination”, “--Full Career Eligibility”, “--Government Office” or “--Disability” or under the section captioned “Death”, any RSUs outstanding under this award will be cancelled effective on the date your employment with the Firm terminates for any reason.

Subject to these terms and conditions (including, but not limited to, sections captioned “Protection-Based Vesting”, “Bonus Recoupment”, “EMEA Malus and Clawback Policy - Identified Staff”, “Recapture Provisions”, “Your Obligations” and “Remedies”), you will be eligible to continue to vest (as

you otherwise would vest if you were still employed by JPMorgan Chase) with respect to your award in accordance with its terms and conditions following the termination of your employment if one of the following circumstances applies to you:

- **Job Elimination**

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- the Firm terminated your employment because your job was eliminated, and
- after you are notified that your job will be eliminated, you provided such services as requested by the Firm in a cooperative and professional manner, and
- you satisfied the Release/Certification Requirements set forth below.

- **Full Career Eligibility**

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- you voluntarily terminated your employment with the Firm, had completed at least five years of continuous service with the Firm immediately preceding your termination date, and
- your Recognized Service (as defined below) on your date of termination equaled or exceeded 15 years, or your combined Recognized Service with the Firm and external professional experience (as attested by you to the Firm) equaled or exceeded 30 years, and
- you provided at least 180 days advance written notice to the Firm of your intention to voluntarily terminate your employment under this provision, during which notice period you provided such services as requested by the Firm in a cooperative and professional manner and you did not perform any services for any other employer, and
- continued vesting shall be appropriate, which determination shall be made prior to your termination and will be based on your performance and conduct (before and after providing notice), and
- for 36 months from the date of grant of this award you do not either perform services in any capacity (such as an employee, contractor, consultant, advisor, or self-employed individual, whether paid or unpaid) for a Financial Services Company (as defined below) or work in your profession (whether or not for a Financial Services Company); provided that you may work for a government, education or Not-for-Profit Organization (as defined below), and
- you satisfied the Release/Certification Requirements set forth below.

After receipt of such advance written notice, the Firm may choose to have you continue to provide services during such 180-day period as a condition to continued vesting or shorten the length of the 180-day period at the Firm's sole discretion, but to a date no earlier than the date you would otherwise meet the service requirement.

Additional advance notice requirements may apply for employees subject to notice period policies (see "Notice Period" below).

- **Government Office**

In the event that you voluntarily terminate your employment with the Firm to accept a Government Office or become a candidate for an elective Government Office, as described at the end of these terms and conditions under the section captioned "Government Office Requirements". See also definition of Government Office in the section captioned "Definitions".

- **Disability**

In the event that

- your employment with the Firm terminates because (i) you are unable to return to work while you are receiving benefits under the JPMorgan Chase Long Term Disability Plan, or for non-U.S. employees, under the equivalent JPMorgan Chase sponsored local country plan (in either case, "LTD Plan"), or (ii) if you are not covered by a LTD Plan, you are unable to return to work due to a long-term disability that would qualify for benefits under the applicable LTD Plan, as determined by the Firm or a third-party designated by the Firm; provided that you (x) request in writing continued vesting due to such disability within 30 days of the date your employment terminates, and (y) provide any requested supporting documentation and (z) receive the Firm's written consent to such treatment, and
- you satisfied the Release/Certification Requirements set forth below.

Release/Certification

To qualify for continued vesting after termination of your employment under any of the foregoing circumstances:

- you must timely execute and deliver a release of claims in favor of the Firm, having such form and terms as the Firm shall specify,
- with respect to “Full Career Eligibility”, prior to the termination of your employment, you must confirm with management that you meet the eligibility criteria (including providing at least 180 days advance written notification), advise that you are seeking to be treated as an individual eligible for “Full Career Eligibility”, and receive written consent to such continued vesting,
- with respect to “Full Career Eligibility” and “Government Office”, it is your responsibility to take the appropriate steps to certify to the Firm prior to each vesting date while the employment restrictions are outstanding, on the authorized form of the Firm, that you have complied with the employment restrictions applicable to you (as described herein) from your date of termination of employment through the applicable vesting date,
- with respect to “Disability”, you must satisfy the notice and documentation described above and receive written consent to such continued vesting, and
- in all cases, complied with all other terms of the Award Agreement. (See section captioned “Your Obligations”.)

Death

If you die while you are eligible to vest in RSUs under this award, the RSUs will immediately vest and will be distributed in shares of Common Stock (after applicable tax withholding) to your designated beneficiary on file with the Firm’s Stock Administration Department, or if no beneficiary has been designated or survives you or if beneficiary designation is not recognized by local legislation, then to your estate. Any shares will be distributed no later than the end of the calendar year immediately following the calendar year which contains your date of death; however, our administrative practice is to register such shares in the name of your beneficiary or estate within 60 days of the Firm’s receipt of any required documentation.

Your Obligations

In consideration of the grant of this award, you agree to comply with and be bound by the obligations set forth below next to the subsections captioned “--Non-Solicitation of Employees and Customers”, “--Confidential Information”, “--Non-Disparagement”, “--Cooperation”, “--Compliance with Award Agreement” and “--Notice Period.”

• Non-Solicitation of Employees and Customers

During your employment by the Firm and for the longer of the (i) one year period following the termination of your employment or, (ii) if your award is not cancelled as of your termination date, the three year period from Grant Date, you will not directly or indirectly, whether on your own behalf or on behalf of any other party, without the prior written consent of the Director of Human Resources: (i) solicit, induce or encourage any of the Firm’s then current employees to leave the Firm or to apply for employment elsewhere, unless such current employee has received official, written notice that his or her employment will be terminated due to job elimination, (ii) hire any employee or former employee who was employed by the Firm at the date your employment terminated, unless the individual’s employment terminated because his or her job was eliminated, or the individual’s employment with the Firm has been terminated for more than six months, (iii) to the fullest extent enforceable under applicable law, solicit or induce or attempt to induce to leave the Firm, or divert or attempt to divert from doing business with the Firm, any then current customers, suppliers or other persons or entities that were serviced by you or whose names became known to you by virtue of your employment with the Firm, or otherwise interfere with the relationship between the Firm and such customers, suppliers or other persons or entities. This does not apply to publicly known institutional customers that you service after your employment with the Firm without the use of the Firm’s confidential or proprietary information.

These restrictions do not apply to authorized actions you take in the normal course of your employment with the Firm, such as employment decisions with respect to employees you supervise or business referrals in accordance with the Firm’s policies.

• Confidential Information

You will not, either during your employment with the Firm or thereafter, directly or indirectly (i) use or disclose to anyone any confidential information related to the Firm’s business, or (ii) communicate with the press or other media about matters related to the Firm, its customers or employees, including matters and activities relating to your employment, or the employment of others, by the Firm, in the case of either (i) or (ii), except as explicitly permitted by the JPMorgan Chase Code of Conduct and applicable policies or law or legal process. In addition, following your termination of employment, you will not, without prior written authorization, access the Firm’s private and internal information through telephonic, intranet or internet means. “Confidential information” shall have the same meaning for the Award Agreement as it has in the JPMorgan Chase Code of Conduct.

Nothing in this award precludes you from reporting to the Firm’s management or directors, the government, a regulator, a self-regulatory agency, your attorneys or a court, conduct you believe to be in violation of the law or concerns of any known or suspected Code of Conduct

violation. It is also not intended to prevent you from responding truthfully to questions or requests from the government, a regulator or in a court of law.

- **Non-Disparagement**

You will not, either during your employment with the Firm or thereafter, make or encourage others to make any public statement or release any information in verbal, written, electronic or any other form, that is intended to, or reasonably could be foreseen to, disparage, embarrass or criticize the Firm or its employees, officers, directors or shareholders as a group. This shall not preclude you from reporting to the Firm's management or directors or to the government or a regulator conduct you believe to be in violation of the law or the Firm's Code of Conduct or responding truthfully to questions or requests for information to the government, a regulator or in a court of law in connection with a legal or regulatory investigation or proceeding.

- **Cooperation**

You will cooperate fully with and provide full and accurate information to the Firm and its counsel with respect to any matter (including any audit, tax proceeding, litigation, investigation or governmental proceeding) with respect to which you may have knowledge or information, subject to reimbursement for actual, appropriate and reasonable out-of-pocket expenses incurred by you.

- **Compliance with Award Agreement**

You will provide the Firm with any information reasonably requested to determine compliance with the Award Agreement, and you authorize the Firm to disclose the terms of the Award Agreement to any third party who might be affected thereby, including your prospective employer.

- **Notice Period**

If you are subject to a notice period or become subject to a notice period after the Grant Date, whether by contract or by policy, that requires you to provide advance written notice of your intention to terminate your employment ("Notice Period"), then as consideration for this award and continued employment, you will provide the Firm with the necessary advance written notice that applies to you, as specified by such contract or policy.

After receipt of your notice, the Firm may choose to have you continue to provide services during the applicable Notice Period or may place you on a paid leave for all or part of the applicable Notice Period. During the Notice Period, you shall continue to devote your full time and loyalty to the Firm by providing services in a cooperative and professional manner and not perform any services for any other employer and shall receive your base salary and certain benefits until your employment terminates. You and the Firm may mutually agree to waive or modify the length of the Notice Period.

Regardless of whether a Notice Period applies to you, you must comply with the 180-day advance notice period described under the subsection captioned "--Full Career Eligibility" in the event you wish to terminate employment under that same subsection.

Remedies

- **Cancellation**

In addition to the cancellation provisions described under the sections captioned "Protection-Based Vesting", "Bonus Recoupment", "EMEA Malus and Clawback Policy - Identified Staff", "Recapture Provisions" and "Termination of Employment", your outstanding RSUs under this award may be cancelled if the Firm in its sole discretion determines that:

- you have failed to comply with any of the advance notice/cooperation requirements or employment restrictions applicable to your termination of employment, or
- you have failed to return the required forms specified under the section captioned "Release/Certification" by the specified deadline, or
- you have violated any of the provisions as set forth above in the section captioned "Your Obligations".

To the extent provided under the subsection captioned "--Amendment" below, JPMorgan Chase reserves the right to suspend vesting of this award and/or distribution of shares under this award, including, without limitation, during any period that JPMorgan Chase is evaluating whether this award is subject to cancellation and/or recovery and/or whether the conditions for distributions of shares under this award are satisfied. JPMorgan Chase is not responsible for any price fluctuations during any period of suspension and, if applicable, suspended units will be reinstated consistent with Plan administration procedures. See also subsection captioned "--No Ownership Rights/Other Limitations".

• Recovery

In addition, you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares of Common Stock previously distributed under this award as follows:

- Payment may be required with respect to any shares of Common Stock distributed within the three year period prior to a notice-of-recovery under this section, if the Firm in its sole discretion determines that:
 - you committed a fraudulent act, or engaged in knowing and willful misconduct related to your employment, or
 - you violated any of the provisions as set forth above in the section captioned “Your Obligations”, or
 - you violated the employment restrictions set forth in the subsection “--Full Career Eligibility” or “--Government Office” following the termination of your employment.
- In addition, payment may be required with respect to any shares distributed within the one year period prior to notice-of-recovery under this section, if the Firm in its sole discretion determines appropriate pursuant to the provisions in the section captioned “Recapture Provisions”.

Notice-of-recovery under this subsection is a written (including electronic) notice from the Firm to you either requiring payment under this subsection or stating that JPMorgan Chase is evaluating requiring payment under this subsection. Without limiting the foregoing, notice-of-recovery will be deemed provided if the Firm makes a good faith attempt to provide written (including electronic) notice at your last known address maintained in the Firm’s employment records. For the avoidance of doubt, a notice-of-recovery that the Firm is evaluating requiring payment under this subsection shall preserve JPMorgan Chase’s rights to require payment as set forth above in all respects and the Firm shall be under no obligation to complete its evaluation other than as the Firm may determine in its sole discretion.

For purposes of this subsection, shares distributed under this award include shares withheld for tax purposes. However, it is the Firm’s intention that you only be required to pay the amounts under this subsection with respect to shares that are or may be retained by you following a determination of tax liability and that you will not be required to pay amounts with respect to shares representing irrevocable tax withholdings or tax payments previously made (whether by you or the Firm) that you will not be able to recover, recapture or reclaim (including as a tax credit, refund or other benefit). Accordingly, JPMorgan Chase will not require you to pay any amount that the Firm or its nominee in his or her sole discretion determines is represented by such withholdings or tax payments.

Payment may be made in shares of Common Stock or in cash. You agree that any repayment will be a lawful recovery under the terms and conditions of your Award Agreement and is not to be construed in any manner as a penalty.

Nothing in the section in any way limits your obligations under “Bonus Recoupment” and “EMEA Malus and Clawback Policy - Identified Staff”.

• Right to an Injunction

You acknowledge that a violation or attempted violation of the obligations set forth herein will cause immediate and irreparable damage to the Firm, and therefore agree that the Firm shall be entitled as a matter of right to an injunction, from any court of competent jurisdiction, restraining any violation or further violation of such obligations; such right to an injunction, however, shall be cumulative and in addition to whatever other remedies the Firm may have under law or equity.

Administrative Provisions

Withholding Taxes: As a result of legal and/or tax obligations the Firm, in its sole discretion, may (i) retain from each distribution the number of shares of Common Stock required to satisfy applicable tax obligations or (ii) implement any other desirable or necessary procedures, so that appropriate withholding and other taxes are paid to the competent authorities with respect to the vested shares and the award. This may include but is not limited to (i) a market sale of a number of such shares on your behalf substantially equal to the withholding or other taxes, (ii) to the extent required by law, withhold from cash compensation, an amount equal to any withholding obligation with respect to the award and shares that vest under this award, and (iii) retaining shares that vest under this award until you pay any taxes associated with the award and/or vested shares directly to the competent authorities.

Right to Set Off: Although the Firm expects to settle this award in share(s) of Common Stock as of the applicable vesting date, as set forth in your Award Agreement, the Firm may, to the maximum extent permitted by applicable law (including Section 409A of the Code to the extent it is applicable to you), retain for itself funds or the Common Stock resulting from any vesting of this award to satisfy any obligation or debt that you owe to the Firm. Notwithstanding any account agreement with the Firm to the contrary, the Firm will not recoup or recover any amount owed from any funds or unrestricted securities held in your name and maintained at the Firm pursuant to such account agreement to satisfy any obligation or debt owed by you under this award without your consent. This restriction on the Firm does not apply to accounts described and authorized in “No Ownership Rights/Other Limitations” described below.

No Ownership Rights/Other Limitations: RSUs do not convey the rights of ownership of Common Stock and do not carry voting rights. No shares of Common Stock will be issued to you until after the RSUs have vested. Shares will be issued in accordance with JPMorgan Chase’s procedures for issuing stock. By accepting this award, you authorize the Firm, in its sole discretion, to establish on your behalf a brokerage account in your name

with the Firm or book-entry account with our stock plan administrator and/or transfer agent and deliver to that account any vested shares derived from the award. You also acknowledge that should there be a determination that the cancellation provisions of this award apply during the period when the vesting of any outstanding RSUs has been suspended, then you agree that such RSUs may be cancelled in whole or part. (See Sections captioned "Protection-Based Vesting", "Bonus Recoupment", "EMEA Malus and Clawback Policy - Identified Staff", "Recapture Provisions", "Termination of Employment" and "Remedies", as well as the subsection captioned "--Amendment" permitting suspension of vesting.)

With respect to any applicable vesting date, JPMorgan Chase may impose for any reason, as of such vesting date for such period as it may specify in its sole discretion, such restrictions on the Common Stock to be issued to you as it may deem appropriate, including, but not limited to, restricting the sale, transfer, pledging, assignment, hedging or encumbrance of such shares of Common Stock. Such restrictions described in the last sentence shall not impact your right to vote or receive dividends with respect to the Common Stock. By accepting this award, you acknowledge that during such specified period should there be a determination that the recovery provisions of this award apply, then you agree that you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares subject to such restrictions (notwithstanding the limitation set forth in the "Right to Set Off" subsection above). (See Sections captioned "Bonus Recoupment" and "Remedies".)

Binding Agreement: The Award Agreement will be binding upon any successor in interest to JPMorgan Chase, by merger or otherwise.

Not a Contract of Employment: Nothing contained in the Award Agreement constitutes a contract of employment or continued employment. Employment is "at-will" and may be terminated by either you or JPMorgan Chase for any reason at any time. This award does not confer any right or entitlement to, nor does the award impose any obligation on the Firm to provide, the same or any similar award in the future and its value is not compensation for purposes of determining severance.

Section 409A Compliance: To the extent that Section 409A of the Code is applicable to this award, distributions of shares hereunder are intended to comply with Section 409A of the Code, and the Award Agreement, including these terms and conditions, shall be interpreted in a manner consistent with such intent.

Notwithstanding anything herein to the contrary, if you (i) are subject to taxation under the Code, (ii) are a specified employee as defined in the JPMorgan Chase 2005 Deferred Compensation Plan and (iii) have incurred a separation from service (as defined in that Plan with the exception of death) and if any units/shares under this award represent deferred compensation as defined in Section 409A and such shares are distributable (under the terms of this award) within six months following, and as a result of your separation from service, then those shares will be delivered to you during the first calendar month after the expiration of six full months from date of your separation from service. Further, if your award is not subject to a substantial risk of forfeiture as defined by regulations issued under Section 409A of the Code, then the remainder of each calendar year immediately following each applicable vesting date set forth in your Award Agreement shall be a payment date for purposes of distributing the vested portion of the award.

Change in Outstanding Shares: In the event of any change in the outstanding shares of Common Stock by reason of any stock dividend or split, recapitalization, issuance of a new class of common stock, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to stockholders of Common Stock other than regular cash dividends, the Committee will make an equitable substitution or proportionate adjustment, in the number or kind of shares of Common Stock or other securities issued or reserved for issuance pursuant to the Plan and to any RSUs outstanding under this award for such corporate events.

Interpretation/Administration: The Committee has sole and complete authority to interpret and administer this Award Agreement, including, without limitation, the power to (i) interpret the Plan and the terms of this Award Agreement; (ii) determine the reason for termination of employment; (iii) determine application of the post-employment obligations and cancellation and recovery provisions; (iv) decide all claims arising with respect to this award; and (v) delegate such authority as it deems appropriate. Any determination contemplated hereunder by the Committee, the Firm, the Director of Human Resources or their respective delegates or nominees shall be binding on all parties.

Notwithstanding anything herein to the contrary, the determinations of the Director of Human Resources, the Firm, the Committee and their respective delegates and nominees under the Plan and the Award Agreements are not required to be uniform. By way of clarification, the Committee, the Firm, the Director of Human Resources and their respective delegates and nominees shall be entitled to make non-uniform and selective determinations and modifications under Award Agreements and the Plan.

Amendment: The Committee or its nominee reserves the right to amend this Award Agreement in any manner, at any time and for any reason; provided, however, that no such amendment shall materially adversely affect your rights under this Award Agreement without your consent except to the extent that the Committee or its delegate considers advisable to (x) comply with applicable laws or changes in or interpretation of applicable laws, regulatory requirements and accounting rules or standards and/or (y) make a change in a scheduled vesting date or impose the restrictions described above under "No Ownership Rights/Other Limitations", in either case, to the extent permitted by Section 409A of the Code if it is applicable to you. This Award Agreement may not be amended except in writing signed by the Director of Human Resources of JPMorgan Chase.

Severability: If any portion of the Award Agreement is determined by the Firm to be unenforceable in any jurisdiction, any court or arbitrator of competent jurisdiction or the Director of Human Resources may reform the relevant provisions (e.g., as to length of service, time, geographical area or scope) to the extent the Firm (or court/arbitrator) considers necessary to make the provision enforceable under applicable law.

Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity: Upon receipt of satisfactory evidence that applicable United States federal, state, local, foreign or supranational ethics or conflict of interest laws or regulations require you to divest your interest in JPMorgan Chase RSUs, the Firm may accelerate the distribution of all or part of your outstanding award effective on or before the required divestiture date; provided that no accelerated distribution shall occur if the Firm determines that such acceleration will violate Section 409A of the Code. Accelerated distribution under this paragraph does not impact the dates as set forth in the “Recovery” section above. The time period for recovery shall be determined by the originally scheduled vesting date or distribution date prior to any acceleration event.

If you have voluntarily terminated your employment and have satisfied the requirements of the section captioned “Government Office Requirements”, acceleration shall apply (to extent required) to the percentage of your outstanding award that would continue to vest under that section. In the case of a termination of employment where the award is outstanding as a result of the subsections entitled “--Job Elimination” or “--Full Career Eligibility”, then acceleration shall apply, to the extent required, to the full outstanding award.

Notwithstanding accelerated distribution pursuant to the foregoing, you will remain subject to the applicable terms of your Award Agreement as if your award had remained outstanding for the duration of the original vesting period and shares had been distributed as scheduled as of each applicable vesting date, including, but not limited to, repayment obligations set forth in the section captioned “Remedies” and the employment restrictions in the sections captioned “Protection-Based Vesting” and “Government Office Requirements” and the subsection “--Full Career Eligibility”.

Use of Personal Data: By accepting this award, you acknowledge that the Firm may process your personal data for the purposes of providing you this award (to include registration of shares and units or establishing a brokerage account on your behalf) and disclosing to third parties, such as service providers or tax and regulatory authorities (e.g., for compensation reporting and payroll tax withholding purposes). Additionally, you agree that the Firm may transfer your personal data to jurisdictions that do not afford protections equivalent to the protections in the country in which we collected your data. Where applicable law provides a right to terminate the foregoing authorization, you may do so at any time, except with respect to tax and regulatory reporting and the Firm’s legal and regulatory obligations. In the event you terminate this authorization, your award will be cancelled.

Governing Law: This award shall be governed by and construed in accordance with the laws of the State of New York, without regard to conflicts of law principles.

Choice of Forum: By accepting this award under the Plan, you agree (and have agreed) that to the extent not otherwise subject to arbitration under an arbitration agreement between you and the Firm, any dispute arising directly or indirectly in connection with this award or the Plan shall be submitted to arbitration in accordance with the rules of the American Arbitration Association if so elected by the Firm in its sole discretion. In the event such a dispute is not subject to arbitration for any reason, you agree to accept the exclusive jurisdiction and venue of the United States District Court for the Southern District of New York with respect to any judicial proceeding in connection with this award or the Plan. You waive, to the fullest extent permitted by law, any objection to personal jurisdiction or to the laying of venue of such dispute and further agree not to commence any action arising out of or relating to this award or the Plan in any other forum.

Waiver of Jury Trial/Class Claims: By accepting this award, you agree, with respect to any claim brought in connection with your employment with the Firm in any forum (i) to waive the right to a jury trial and (ii) that any judicial proceeding or arbitration claim will be brought on an individual basis, and you hereby waive any right to submit, initiate, or participate in a representative capacity or as a plaintiff, claimant or member in a class action, collective action, or other representative or joint action.

Litigation: By accepting any award under the Plan, you agree (and have agreed) that in any action or proceeding by the Firm (other than a derivative suit in the right of the Firm) to enforce the terms and conditions of this Award Agreement or any other Award Agreement where the Firm is the prevailing party, the Firm shall be entitled to recover from you its reasonable attorney fees and expenses incurred in such action or proceeding. In addition, you agree that you are not entitled to, and agree not to seek, advancement of attorney fees and indemnification under the Firm’s By-Laws in the event of such a suit by the Firm.

Non-transferability: Neither this award or any other outstanding awards of RSUs, nor your interests or rights in any such awards, shall be assigned, pledged, transferred, hedged, hypothecated or subject to any lien. An award may be transferred following your death by will, the laws of descent or by a beneficiary designation on file with the Firm.

Outstanding Awards: The Administrative provisions set forth above shall apply to any award of RSUs outstanding as of the date hereof, and such awards are hereby amended.

Definitions

“**Cause**” means a determination by the Firm that your employment terminated as a result of your (i) violation of any law, rule or regulation (including rules of self-regulatory bodies) related to the Firm’s business, (ii) indictment or conviction of a felony, (iii) commission of a fraudulent act, (iv) violation of the JPMorgan Chase Code of Conduct or other Firm policies or misconduct related to your duties to the Firm (other than immaterial and inadvertent violations or misconduct), (v) grossly inadequate performance of the duties associated with your position or job function or failure to follow reasonable directives of your manager, or (vi) any act or failure to act that is injurious to the interests of the Firm or its relationship with a customer, client or an employee.

“Financial Services Company” means a business enterprise that engages in any of the following services (itself or through an affiliate or subsidiary), regardless of whether such services are the principle strategy or revenue-generating activity:

- commercial or retail banking, including, but not limited to, commercial, institutional and personal trust, custody and/or lending and processing services, internet banking, originating and servicing mortgages, issuing and servicing credit cards, payment servicing or processing or merchant services,
- insurance, including but not limited to, guaranteeing against loss, harm, damage, illness, disability or death, providing and issuing annuities, acting as principal, agent or broker for purpose of the forgoing,
- financial, investment or economic advisory services, including but not limited to, investment banking services (such as advising on mergers or dispositions, underwriting, dealing in, or making a market in securities or other similar activities), brokerage services, investment management services, asset management services, foreign exchange services, interbank networks and hedge funds,
- issuing, trading or selling instruments representing interests in pools of assets or in derivatives instruments,
- financial technology companies, such as those selling blockchain services, or offering or selling financial products/services,
- advising on, or investing in, private equity or real estate funds or ventures, or
- any similar activities that the Director of Human Resources or nominee determines in his or her sole discretion constitute financial services.

“Firmwide Financial Threshold” means a cumulative return on tangible common equity for calendar years 2022, 2023 and 2024 of not less than 15%. Cumulative return on tangible common equity means (i) the sum of the Firm’s reported net income for all three calendar years, divided by (ii) reported year-end tangible equity averaged over the three years.

“Government Office” means (i) a full-time position in an elected or appointed office in local, state, or federal government (including equivalent positions outside the U.S. or in a supranational organization), not reasonably anticipated to be a full-career position, or (ii) conducting a bona fide full-time campaign for such an elective public office after formally filing for candidacy, where it is customary and reasonably necessary to campaign full-time for the office.

“Line of Business” means a business unit of the Firm (or one or more business units designated below under the definition “Line of Business Financial Threshold” of the Corporate Investment Bank). All Corporate Functions (including the functions of the Chief Investment Office) are considered a single Line of Business.

“Line of Business Financial Threshold” means the financial threshold set forth below for the following Lines of Business based on the Firm’s management reporting system:

Asset & Wealth Management	Annual negative pre-tax pre-provision income ¹
Card and Auto	Annual negative pre-tax pre-loan loss reserve income ²
Commercial Banking	Annual negative pre-tax pre-loan loss reserve income ²
Corporate Investment Bank	Annual negative pre-tax pre-provision income ¹ for CIB overall or annual negative allocated product revenues (excluding XVA) for: <ul style="list-style-type: none"> • Fixed Income • Equities • Securities Services • Global Investment Banking • Payments
Consumer Banking, U.S. Wealth Management and Business Banking	Annual negative pre-tax pre-loan loss reserve income ²
Corporate Functions (including Chief Investment Office)	Annual negative pre-tax pre-provision income ¹ at the Firm level
Home Lending	Annual negative pre-tax pre-loan loss reserve income ²
¹ Pre-tax pre-provision income means Revenue less Expenses ² Pre-tax pre-loan loss reserve income means Revenue less (Expenses plus Net Charge-offs)	

“Not-for-Profit Organization” means an entity exempt from tax under state law and under Section 501(c)(3) of the Code. Section 501(c)(3) only includes entities organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals. Not-for-Profit Organization shall also mean entities outside the United States exempt from local and national tax laws because they are organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals.

“Recognized Service” means the period of service as an employee set forth in the Firm’s applicable service-related policies.

Government Office Requirements

You may be eligible to continue vesting in all or part of your award if you voluntarily resign to accept a Government Office (as defined above) or to become a candidate for an elective Government Office.

Full Career Eligibility:

“Government Office Requirements” does not apply to you if you satisfy the subsection captioned “--Full Career Eligibility” as of the date that you voluntarily terminate your employment with the Firm.

Eligibility:

Eligibility for continued vesting is conditioned on your providing the Firm:

- At least 60 days’ advance written notice of your intention to resign to accept or pursue a Government Office (see section captioned “Definitions”), during which period you must perform in a cooperative and professional manner services requested by the Firm and not provide services for any other employer. The Firm may elect to shorten this notice period at the Firm’s sole discretion.
- Confirmation, in a form of satisfactory to the firm, that vesting in this award pursuant to this provision would not violate any applicable law, regulation or rule.
- Documentation in a form satisfactory to the Firm that your resignation is for the purpose of accepting a Government Office or becoming a candidate for a Government Office. (See Section captioned “Definitions”.)

Portion of Your Awards Subject to Continued Vesting:

Subject to the conditions below, the percentage of your outstanding awards that will continue to vest in accordance with this award’s original schedule will be based on your years of continuous service completed with the Firm immediately preceding your termination date, as follows:

- 50% if you have at least 3 but less than 4 years of continuous service,
- 75% if you have at least 4 but less than 5 years of continuous service, or
- 100% if you have 5 or more years of continuous service.

The portion of each award subject to continued vesting above is referred to as the “CV Award” and the portion not subject to continued vesting will be cancelled on the date your employment terminates.

Conditions for Continued Vesting of Awards:

- You must remain in a non-elective Government Office for two or more years after your employment with the Firm terminates to receive in full your CV Award; provided that if your non-elective Government Office is for a period less than two years, you will be entitled to retain any portion of the CV Award with a vesting date during your period of Government Service; or
- In the case of resignation from the Firm to campaign for an elective Government Office, your name must be on the primary or final public ballot for the election. (If you are not elected, see below for employment restrictions.)

Satisfaction of Conditions:

If your service in a Government Office ends two years or more after your employment with the Firm terminates, or in the case of resignation from the Firm to campaign for a Government Office, your name is on the primary or final public ballot for the election and you are not elected, any CV Awards then outstanding and any such awards that would have then been outstanding but for an accelerated distribution of shares (as described in the subsection captioned “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”) will be subject for the remainder of the applicable vesting period to the same terms and conditions of this Award Agreement, including employment restrictions during the vesting period, as if you had resigned from the Firm having met the requirements for Full Career Eligibility.

Failure to Satisfy Conditions:

If you do not satisfy the above “Conditions for Continued Vesting of Awards”, any outstanding RSUs under each CV Award will be cancelled. You also will be required to repay the Fair Market Value of the number of shares (before tax and other withholdings) of Common Stock distributed to you that would have been outstanding as RSUs on the date you failed to satisfy the “Condition for Continued Vesting of Awards” but for their accelerated distribution (as described in the subsection captioned “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”). Fair Market Value for this purpose will be determined as the date that the shares were distributed.

JPMORGAN CHASE & CO. LONG-TERM INCENTIVE PLAN
TERMS AND CONDITIONS OF _____, 20__
PERFORMANCE SHARE UNIT AWARD
OPERATING COMMITTEE
(Protection-Based Vesting Provisions)

Award Agreement

These terms and conditions are made part of the Award Agreement dated as of _____, 20__ (“Grant Date”) awarding performance share units (“PSUs”) pursuant to the terms of the JPMorgan Chase & Co. Long-Term Incentive Plan (“Plan”). To the extent the terms of the Award Agreement (all references to which will include these terms and conditions) conflict with the Plan, the Plan will govern. The Award Agreement, the Plan and Prospectus supersede any other agreement, whether written or oral, that may have been entered into by the Firm and you relating to this award.

This award was granted on the Grant Date subject to the Award Agreement and Plan. **Unless you decline by the deadline and in the manner specified in the Award Agreement, you will have agreed to be bound by these terms and conditions, effective as of the Grant Date.** If you decline the award, it will be cancelled as of the Grant Date.

Capitalized terms that are not defined in “Definitions” below or elsewhere in the Award Agreement will have the same meaning as set forth in the Plan.

JPMorgan Chase & Co. will be referred to throughout the Award Agreement as “JPMorgan Chase”, and together with its subsidiaries as the “Firm”.

Form and Purpose of Award

Each PSU represents a non-transferable right to receive one share of Common Stock as of the vesting date as set forth in your Award Agreement.

The purpose of this award is to further emphasize sustained long-term performance and to align your interests with those of the Firm and its shareholders.

Protection-Based Vesting

This award is intended and expected to vest on the vesting date, provided that you are continuously employed by the Firm through such vesting date, or you meet the requirements for continued vesting described under the subsections “--Job Elimination”, “--Full Career Eligibility”, “--Government Office” or “--Disability”. However, vesting and the number of PSUs that will vest are subject to these terms and conditions (including, but not limited to, sections captioned “Number to Vest on Vesting Date”, “Capital Ratio Performance Threshold”, “Recapture Provisions”, “Remedies” and the following protection-based vesting provision).

Up to a total of fifty percent of your award (including any associated Reinvested Dividend Equivalent Share Units) that would otherwise be distributable to you on the vesting date (“At Risk PSUs”) may be cancelled if the Chief Executive Officer of JPMorgan Chase (“CEO”) determines in his or her sole discretion that cancellation of all or portion of the At Risk PSUs is appropriate in light of any one or a combination of the following factors:

- Your performance in relation to the priorities for your position, or the Firm’s performance in relation to the priorities for which you share responsibility as a member of the Operating Committee, have been unsatisfactory for a sustained period of time. Among the factors the CEO may consider in assessing performance are: net income, total net revenue, earnings per share and capital ratios of the Firm, both on an absolute basis and, as appropriate, relative to peer firms.
- For any calendar year ending during the vesting period, JPMorgan Chase’s annual pre-tax pre-provision income at the Firm level is negative.
- RSU awards granted to participants in a Line of Business for which you exercise, or during the vesting period exercised, direct or indirect responsibility, were in whole or in part cancelled because the Line of Business did not meet its annual Line of Business Financial Threshold.
- The Firm does not meet the Firmwide Financial Threshold.

For avoidance of doubt, cancellation of the At Risk PSUs, in whole or part, for one or more of the above factors may occur prior to the end of the Performance Period and the maximum number of At Risk PSUs subject to cancellation prior to the end of the Performance Period will be up to fifty percent of the Target Award Number.

In the event that your employment terminates due to “Job Elimination”, “Full Career Eligibility”, “Government Office” or “Disability” thereby entitling you to continued vesting in your award, (or potentially acceleration due to satisfaction of the Government Office Requirements), the cancellation circumstances described above will continue to apply.

Any determination above with respect to protection-based vesting provisions is subject to ratification by the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase (“Committee”). In the case of an award to any current or former CEO, all such determinations shall be made by the Committee and ratified by the Board.

Number to Vest on the Vesting Date

Subject to any cancellation in whole or part of your award pursuant to these terms and conditions:

Performance calculation: On the vesting date, you will vest in a number of PSUs derived by multiplying the Target Award Number by the Award Payout Percentage determined using the Performance Table. See sections captioned “[Calculation of Performance Ranking](#)” and “[Definitions](#)”.

You will also vest in additional shares of Common Stock as calculated under the section captioned, “[Reinvested Dividend Equivalent Share Units](#)”. Delivery of vested shares to your account will be made not later than the date specified in the last sentence of the subsection captioned “Section 409A Compliance”.

Reinvested Dividend Equivalent Share Units

If dividends are paid on Common Stock during the Vesting Period while the award is outstanding, you will receive on the vesting date additional units representing shares of Common Stock as calculated in this section. The number, if any, will be based on the dividends that would have been paid during the Vesting Period as of each dividend payment date on the actual number of shares of Common Stock distributable to you resulting from the vesting of the PSUs, if any, and treated as reinvested in additional shares of Common Stock on each dividend payment based on the Fair Market Value of one share of Common Stock on each dividend payment date (“Reinvested Dividend Equivalent Share Units”).

Holding Requirement

As of the vesting date set forth in your Award Agreement, you shall be entitled to be issued a number of shares of the Common Stock of JPMorgan Chase equal to the number of PSUs, if any, plus any additional Reinvested Dividend Equivalent Share Units, vesting on such date, less the number withheld to satisfy tax withholding obligations. The net number of shares issued to you will be held in an account in your name with restrictions preventing you from transferring, assigning, hedging, selling, pledging or otherwise encumbering such shares for a two year period commencing as of the vesting date and ending as of the second anniversary of the vesting date. Such restrictions shall only lapse, prior to the expiration of the two year holding period, in the event of your death or for an accelerated distribution for ethics or conflict reasons. See section captioned, “[Death](#)” and subsection captioned, “Accelerated Distribution for Ethics or Conflict Reasons Resulting from Employment by a Government Entity”.

Calculation of Performance Ranking

For purposes of the Performance Ranking, the ranking of the Firm and of each Performance Company for the Performance Period shall be determined and calculated by the Calculation Agent, using the definitions of “Average Tangible Common Equity” (if otherwise applicable), “Calculated PSUs”, “Firm Reported ROTCE”, “Performance Table” (including its footnote) and “ROTCE” as set forth in the “[Definitions](#)” section of these terms and conditions. See section captioned “[Definitions](#)”. Except for Firm Reported ROTCE, calculations will be expressed as a decimal to the second place (i.e. xx.yy%), rounded to the nearest hundredth. See section captioned, “[Definitions--Performance Table](#)” in the event of a tie. All performance based calculations as set forth herein are binding and conclusive on you and your successors.

Capital Ratio Performance Threshold

Unvested PSUs are subject to reduction if the Firm’s Common Equity Tier 1 (CET1) capital ratio at any year end falls below a predetermined threshold of ____%.

If the Firm’s CET1 capital ratio at any year end during the Performance Period is below this predetermined threshold, up to one-third of the Target Award Number of PSUs will be subject to downward adjustment by the CMDC for each such year.

Vesting Period

The period from the Grant Date to the vesting date is the “Vesting Period”. (See “Administrative Provision--Amendment” pursuant to which the Firm may extend the vesting period and “No Ownership Rights/Other Limitations” pursuant to which the Firm may place restrictions on delivered shares of Common Stock following the vesting date and section captioned, “Holding Period” above.)

Bonus Recoupment

In consideration of the grant of this award, you agree that you are subject to the JPMorgan Chase Bonus Recoupment Policy (or successor policy) as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 20____ and to this award. You can access this policy as currently in effect by clicking the following link to the JPMorgan Chase & Co. Corporate Governance Principles web page and scrolling to the Bonus Recoupment Policy located under the section titled “Other Matters”:

<https://about.jpmorganchase.com/about/governance/corporate-governance-principles>

For the avoidance of doubt, nothing in these terms and conditions in any way limits the rights of the Firm under the JPMorgan Chase Bonus Recoupment Policy (or successor policy).

Recapture Provisions (Detrimental Conduct, Risk-Related and Other Recapture Provisions)

Notwithstanding any terms of this Award Agreement to the contrary, JPMorgan Chase reserves the right in its sole discretion to cancel up to 100% of your award (for the avoidance of doubt, including any associated Reinvested Dividend Equivalent Share Units as well as the Calculated PSUs) and, to the extent set forth in “Remedies” below, to recover from you up to an amount equal to the Fair Market Value (determined as of the vesting date) of the gross number of shares of Common Stock previously distributed (including vested shares subject to the Holding Requirements and shares withheld for tax purposes) under this award if the Firm in its sole discretion determines that:

- you engaged in conduct detrimental to the Firm insofar as it causes material financial or reputational harm to the Firm or its business activities, or
- this award was based on materially inaccurate performance metrics, whether or not you were responsible for the inaccuracy, or
- this award was based on a material misrepresentation by you, or
- you improperly or with gross negligence failed to identify, raise or assess, in a timely manner and as reasonably expected, risks and/or concerns with respect to risks material to the Firm or its business activities, or
- your employment was terminated for Cause (see section captioned “Definitions” below) or, in the case of a determination after the termination of your employment, that your employment could have been terminated for Cause.

See section captioned “Remedies” for additional information.

Termination of Employment

Except as explicitly set forth below under the subsections captioned “--Job Elimination”, “--Full Career Eligibility”, “--Government Office” or “--Disability” or under the section captioned “Death”, this award (for avoidance of doubt, including any associated Reinvested Dividend Equivalent Share Units) will be cancelled in full effective on the date your employment with the Firm terminates for any reason.

Subject to these terms and conditions (including, but not limited to, sections captioned “Protection-Based Vesting”, “Number to Vest on Vesting Date”, “Bonus Recoupment”, “Recapture Provisions”, “Your Obligations” and “Remedies”) you will be eligible to continue to vest (as you otherwise would vest if you were still employed by JPMorgan Chase) with respect to your award in accordance with its terms and conditions following the termination of your employment if one of the following circumstances applies to you:

• Job Elimination

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- the Firm terminated your employment because your job was eliminated, and
- after you are notified that your job will be eliminated, you provided such services as requested by the Firm in a cooperative and professional manner, and
- you satisfied the Release/Certification Requirements set forth below.

• Full Career Eligibility

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- you voluntarily terminated your employment with the Firm, had completed at least five years of continuous service with the Firm immediately preceding your termination date, and
- the sum of your age and Recognized Service (as defined below) on your date of termination equaled or exceeded 60, and
- you provided at least 180 days advance written notice to the Firm of your intention to voluntarily terminate your employment under this provision, during which notice period you provided such services as requested by the Firm in a cooperative and professional manner and you did not perform any services for any other employer, and
- continued vesting shall be appropriate, which determination shall be made prior to your termination and will be based on your performance and conduct (before and after providing notice), and
- for 36 months from the date of grant of this award, you do not either perform services in any capacity (such as an employee, contractor, consultant advisor, or self-employed individual, whether paid or unpaid) for a Financial Services Company (as defined below) or work in your profession (whether or not for a Financial Services Company); provided that you may work for a government, education or Not-for-Profit Organization (as defined below), and
- you satisfied the Release/Certification Requirements set forth below.

After receipt of such advance written notice, the Firm may choose to have you continue to provide services during such 180-day period as a condition to continued vesting or shorten the length of the 180-day period at the Firm’s sole discretion, but to a date no earlier than the date you would otherwise meet the age and service requirements.

Additional advance notice requirements may apply for employees subject to notice period policies. (See “Notice Period” below.)

- **Government Office**

In the event that you voluntarily terminate your employment with the Firm to accept a Government Office or become a candidate for an elective Government Office, as described at the end of these terms and conditions under the section captioned “Government Office Requirements”. See also definition of Government Office in the section captioned “Definitions”.

- **Disability**

In the event that

- your employment with the Firm terminates because (i) you are unable to return to work while you are receiving benefits under the JPMorgan Chase Long Term Disability Plan, or for non-U.S. employees, under the equivalent JPMorgan Chase-sponsored local country plan (in either case, “LTD Plan”), or (ii) if you are not covered by a LTD Plan, you are unable to return to work due to a long-term disability that would qualify for benefits under the applicable LTD Plan, as determined by the Firm or a third-party designated by the Firm; provided that you (x) request in writing continued vesting due to such disability within 30 days of the date your employment terminates, and (y) provide any requested supporting documentation and (z) receive the Firm’s written consent to such treatment, and
- you satisfied the Release/Certification Requirements set forth below.

Release/Certification

To qualify for continued vesting after termination of your employment under any of the foregoing circumstances:

- you must timely execute and deliver a release of claims in favor of the Firm, having such form and terms as the Firm shall specify,
- with respect to Full Career Eligibility, prior to the termination of your employment, you must confirm with management that you meet the eligibility criteria (including providing at least 180 days advance written notification), advise that you are seeking to be treated as an individual eligible for Full Career Eligibility, and receive written consent to such continued vesting,
- with respect to “Full Career Eligibility” and “Government Office”, it is your responsibility to take the appropriate steps to certify to the Firm prior to the vesting date while the employment restrictions are outstanding on the authorized form of the Firm that you have complied with the employment restrictions applicable to you (as described herein) from your date of termination of employment through the applicable vesting date,
- with respect to Disability, you must satisfy the notice and documentation described above and receive written consent to such continued vesting, and
- in all cases, otherwise complied with all other terms of the Award Agreement. (See section captioned “Your Obligations” below.)

Death

If you die while you are eligible to vest in this award, your designated beneficiary on file with the Firm’s Stock Administration Department (or your estate or if no beneficiary has been designated or survives you or if beneficiary designation is not recognized by local legislation) may be entitled to receive a distribution of a number of shares of Common Stock associated with your award. The Award Payout Percentage in the case of death is based on the Number to Vest on the Vesting Date calculation described above using the average performance of all completed calendar years, multiplied by one-third of the Target Award Number of PSUs for each completed calendar year in the Performance Period, and using the Award Payout Percentage equal to 100 percent for any remaining calendar years in the Performance Period.

In addition, your beneficiary or your estate shall receive additional shares of Common Stock, i.e. Reinvested Dividend Equivalent Share Units, as set forth in the section captioned, “Reinvested Dividend Equivalent Share Units” but based on dividend equivalents up to the date of your death.

Any shares will be distributed no later than the end of the calendar year immediately following the calendar year which contains your date of death; however, our administrative practice is to register such shares in the name of your beneficiary or estate within 60 days of the Firm’s receipt of any required documentation.

Your Obligations

In consideration of the grant of this award, you agree to comply with and be bound by the obligations set forth below next to the subsections captioned “--Non-Solicitation of Employees and Customers”, “--Confidential Information”, “--Non-Disparagement”, “--Cooperation”, “--Compliance with Award Agreement”, and “--Notice Period”.

- **Non-Solicitation of Employees and Customers**

During your employment by the Firm and for the longer of the (i) one year period following the termination of your employment or, (ii) if your award is not cancelled as of your termination date, the three year period from Grant Date, you will not directly or indirectly, whether on your own behalf or on behalf of any other party, without the prior written consent of the Director of Human Resources: (i) solicit, induce or encourage any of the Firm’s then current employees to leave the Firm or to apply for employment elsewhere, unless such current employee has received official, written notice that his or her employment will be terminated due to job elimination (ii) hire any employee or former employee who was employed by the Firm at the date your employment terminated, unless the individual’s employment terminated because his or her job

was eliminated, or the individual's employment with the Firm has been terminated for more than six months, (iii) to the fullest extent enforceable under applicable law, solicit or induce or attempt to induce to leave the Firm, or divert or attempt to divert from doing business with the Firm, any then current customers, suppliers or other persons or entities that were serviced by you or whose names became known to you by virtue of your employment with the Firm, or otherwise interfere with the relationship between the Firm and such customers, suppliers or other persons or entities. This does not apply to publicly known institutional customers that you service after your employment with the Firm without the use of the Firm's confidential or proprietary information.

These restrictions do not apply to authorized actions you take in the normal course of your employment with the Firm, such as employment decisions with respect to employees you supervise or business referrals in accordance with the Firm's policies.

- **Confidential Information**

You will not, either during your employment with the Firm or thereafter, directly or indirectly (i) use or disclose to anyone any confidential information related to the Firm's business, or (ii) communicate with the press or other media about matters related to the Firm, its customers or employees, including matters and activities relating to your employment, or the employment of others, by the Firm, in the case of either (i) or (ii), except as explicitly permitted by the JPMorgan Chase Code of Conduct and applicable policies or law or legal process. In addition, following your termination of employment, you will not, without prior written authorization, access the Firm's private and internal information through telephonic, intranet or internet means. "Confidential information" shall have the same meaning for the Award Agreement as it has in the JPMorgan Chase Code of Conduct.

Nothing in this award precludes you from reporting to the Firm's management or directors, the government, a regulator, a self-regulatory agency, your attorneys or a court, conduct you believe to be in violation of the law or concerns of any known or suspected Code of Conduct violation. It is also not intended to prevent you from responding truthfully to questions or requests from the government, a regulator or in a court of law.

- **Non-Disparagement**

You will not, either during your employment with the Firm or thereafter, make or encourage others to make any public statement or release any information in verbal, written, electronic or any other form, that is intended to, or reasonably could be foreseen to, disparage, embarrass or criticize the Firm or its employees, officers, directors or shareholders as a group. This shall not preclude you from reporting to the Firm's management or directors or to the government or a regulator conduct you believe to be in violation of the law or the Firm's Code of Conduct or responding truthfully to questions or requests for information to the government, a regulator or in a court of law in connection with a legal or regulatory investigation or proceeding.

- **Cooperation**

You will cooperate fully with and provide full and accurate information to the Firm and its counsel with respect to any matter (including any audit, tax proceeding, litigation, investigation or governmental proceeding) with respect to which you may have knowledge or information, subject to reimbursement for actual, appropriate and reasonable out-of-pocket expenses incurred by you.

- **Compliance with Award Agreement**

You will provide the Firm with any information reasonably requested to determine compliance with the Award Agreement, and you authorize the Firm to disclose the terms of the Award Agreement to any third party who might be affected thereby, including your prospective employer.

- **Notice Period**

If you are subject to a notice period or become subject to a notice period after the Grant Date, whether by contract or by policy, that requires you to provide advance written notice of your intention to terminate your employment ("Notice Period"), then as consideration for this award and continued employment, you will provide the Firm with the necessary advance written notice that applies to you, as specified by such contract or policy.

After receipt of your notice, the Firm may choose to have you continue to provide services during the applicable Notice Period or may place you on a paid leave for all or part of the applicable Notice Period. During the Notice Period, you shall continue to devote your full time and loyalty to the Firm by providing services in a cooperative and professional manner and not perform any services for any other employer and shall receive your base salary and certain benefits until your employment terminates. You and the Firm may mutually agree to waive or modify the length of the Notice Period.

Regardless of whether a Notice Period applies to you, you must comply with the 180-day advance notice period described under the subsection captioned "-- Full Career Eligibility" in the event you wish to terminate employment under that same subsection.

Remedies

- **Cancellation**

In addition to the cancellation provisions described under the sections captioned "Protection-Based Vesting", "Bonus Recoupment", "Recapture Provisions" and "Termination of Employment", your outstanding PSUs under this award may be cancelled if the Firm in its sole discretion determines that:

- you have failed to comply with any of the advance notice/cooperation requirements or employment restrictions applicable to your termination of employment, or
- you have failed to return the required forms specified under the section captioned “Release/Certification” by the specified deadline, or
- you have violated any of the provisions as set forth above in the section captioned “Your Obligations”.

To the extent provided under the subsection captioned “--Amendment” below, JPMorgan Chase reserves the right to suspend vesting of this award and/or distribution of shares under this award, including, without limitation, during any period that JPMorgan Chase is evaluating whether this award is subject to cancellation and/or recovery and/or whether the conditions for distributions of shares under this award are satisfied. The Firm is not responsible for any price fluctuations during any period of suspension and, if applicable, suspended units will be reinstated consistent with Plan administration procedures. See also “Administrative Provisions-No Ownership Rights/Other Limitations”.

• Recovery

In addition, you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date or acceleration date) of the gross number of shares of Common Stock previously distributed, including vested shares subject to the Holding Requirements, under this award as follows:

- Payment may be required with respect to any shares of Common Stock distributed within the three year period prior to a notice-of-recovery under this section, if the Firm in its sole discretion determines that:
 - you committed a fraudulent act, or engaged in knowing and willful misconduct related to your employment;
 - you violated any of the provisions as set forth above in the section captioned “Your Obligations,” or
 - you violated the employment restrictions set forth in the subsection “Full Career Eligibility” or “Government Office” following the termination of your employment.
- In addition, payment may be required with respect to any shares distributed within the one year period prior to notice-of-recovery under this section, if the Firm in its sole discretion determines appropriate pursuant to the provisions in the section captioned “Recapture Provisions”.

Notice-of-recovery under this subsection is a written (including electronic) notice from the Firm to you either requiring payment under this subsection or stating that JPMorgan Chase is evaluating requiring payment under this subsection. Without limiting the foregoing, notice-of-recovery will be deemed provided if the Firm makes a good faith attempt to provide written (including electronic) notice at your last known address maintained in the Firm’s employment records. For the avoidance of doubt, a notice-of-recovery that the Firm is evaluating requiring payment under this subsection shall preserve JPMorgan Chase’s rights to require payment as set forth above in all respects and the Firm shall be under no obligation to complete its evaluation other than as the Firm may determine in its sole discretion.

For purposes of this subsection, shares distributed under this award include shares withheld for tax purposes. However, it is the Firm’s intention that you only be required to pay the amounts under this subsection with respect to shares that are or may be retained by you following a determination of tax liability and that you will not be required to pay amounts with respect to shares representing irrevocable tax withholdings or tax payments previously made (whether by you or the Firm) that you will not be able to recover, recapture or reclaim (including as a tax credit, refund or other benefit). Accordingly, JPMorgan Chase will not require you to pay any amount that the Firm or its nominee in his or her sole discretion determines is represented by such withholdings or tax payments.

Payment may be made in shares of Common Stock or in cash. You agree that any repayment will be a lawful recovery under the terms and conditions of your Award Agreement and is not to be construed in any manner as a penalty.

Nothing in the section in any way limits your obligations under “Bonus Recoupment”.

• Right to an Injunction

You acknowledge that a violation or attempted violation of the obligations set forth herein will cause immediate and irreparable damage to the Firm, and therefore agree that the Firm shall be entitled as a matter of right to an injunction, from any court of competent jurisdiction, restraining any violation or further violation of such obligations; such right to an injunction, however, shall be cumulative and in addition to whatever other remedies the Firm may have under law or equity.

Administrative Provisions

Withholding Taxes: As a result of legal and/or tax obligations the Firm, in its sole discretion, may (i) retain from each distribution the number of shares of Common Stock required to satisfy applicable tax obligations or (ii) implement any other desirable or necessary procedures, so that appropriate withholding and other taxes are paid to the competent authorities with respect to the vested shares and the award. This may include but is not limited to (i) a market sale of a number of such shares on your behalf substantially equal to the withholding or other taxes, (ii) to the extent required by law, withhold from cash compensation, an amount equal to any withholding obligation with respect to the award and shares that vest under this award, and (iii) retaining shares that vest under this award until you pay any taxes associated with the award and vested shares directly to the competent authorities.

Right to Set Off: Although the Firm expects to settle this award in share(s) of Common Stock as of the applicable vesting date, as set forth in your Award Agreement, the Firm may, to the maximum extent permitted by applicable law (including Section 409A of the Code to the extent it is applicable to you), retain for itself funds or the Common Stock resulting from any vesting of this award to satisfy any obligation or debt that you owe

to the Firm. Notwithstanding any account agreement with the Firm to the contrary, the Firm will not recoup or recover any amount owed from any funds or unrestricted securities held in your name and maintained at the Firm pursuant to such account agreement to satisfy any obligation or debt or obligation owed by you under this award without your consent. This restriction on the Firm does not apply to accounts described and authorized in “No Ownership Rights/Other Limitations” described below.

No Ownership Rights/Other Limitations: PSUs do not convey the rights of ownership of Common Stock and do not carry voting rights. No shares of Common Stock will be issued to you until after the number of PSUs have been determined, if any, and have vested. Shares will be issued in accordance with JPMorgan Chase’s procedures for issuing stock. By accepting this award, you authorize the Firm, in its sole discretion, to establish on your behalf a brokerage account in your name with the Firm or book-entry account with our stock plan administrator and/or transfer agent and deliver to that account any vested shares derived from the award. You also acknowledge that should there be a determination that the cancellation provisions of this award apply during the period when the vesting of any outstanding PSUs has been suspended, then you agree that such PSUs may be cancelled in whole or part. (See Sections captioned “Protection-Based Vesting”, “Bonus Recoupment”, “Recapture Provisions”, “Termination of Employment” and “Remedies”, as well as the subsection captioned “--Amendment” permitting suspension of vesting.)

With respect to any applicable vesting date, JPMorgan Chase may impose for any reason, as of such vesting date for such period as it may specify in its sole discretion, such restrictions on the Common Stock to be issued to you as it may deem appropriate, including, but not limited to, restricting the sale, transfer, pledging, assignment, hedging or encumbrance of such shares of Common Stock. Such restrictions described in the last sentence shall not impact your right to vote or receive dividends with respect to the Common Stock. By accepting this award, you acknowledge that during such specified period should there be a determination that the recovery provisions of this award apply, then you agree that you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares subject to such restrictions (notwithstanding the limitation set forth in the “Right to Set Off” subsection above). (See sections captioned “Bonus Recoupment” and “Remedies”.)

Binding Agreement: The Award Agreement will be binding upon any successor in interest to JPMorgan Chase, by merger or otherwise.

Not a Contract of Employment: Nothing contained in the Award Agreement constitutes a contract of employment or continued employment. Employment is “at-will” and may be terminated by either you or JPMorgan Chase for any reason at any time. This award does not confer any right or entitlement to, nor does the award impose any obligation on the Firm to provide, the same or any similar award in the future and its value is not compensation for purposes of determining severance.

Section 409A Compliance: To the extent that Section 409A of the Code is applicable to this award, distributions of shares hereunder are intended to comply with Section 409A of the Code, and the Award Agreement, including these terms and conditions, shall be interpreted in a manner consistent with such intent.

Notwithstanding anything herein to the contrary, if you (i) are subject to taxation under the Code, (ii) are a specified employee as defined in the JPMorgan Chase 2005 Deferred Compensation Plan and (iii) have incurred a separation from service (as defined in that Plan with the exception of death) and if any units/shares under this award represent deferred compensation as defined in Section 409A and such shares are distributable (under the terms of this award) within six months following, and as a result of your separation from service, then those shares will be delivered during the first calendar month after the expiration of six full months from date of your separation from service. Further, if your award is not subject to a substantial risk of forfeiture as defined by regulations issued under Section 409A of the Code, then the remainder of each calendar year immediately following the vesting date set forth in your Award Agreement shall be a payment date for purposes of distributing the vested portion of the award.

Change in Outstanding Shares: In the event of any change in the outstanding shares of Common Stock by reason of any stock dividend or split, recapitalization, issuance of a new class of common stock, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to stockholders of Common Stock other than regular cash dividends, the Committee will make an equitable substitution or proportionate adjustment, in the number or kind of shares of Common Stock or other securities issued or reserved for issuance pursuant to the Plan and to any PSUs outstanding under this award for such corporate events.

Other Equitable Adjustments: The Committee may make adjustments (up or down) to the award as it deems to be equitable, to maintain the intended economics of the award in light of changed circumstances, which may include unusual or non-recurring events affecting the Firm (or the Performance Companies) or its financial statements in each case resulting from changes in accounting methods, practices or policies, changes in capital structure by reason of legal or regulatory requirements and such other changed circumstances, as the Committee may deem appropriate.

Interpretation/Administration: The Committee has sole and complete authority to interpret and administer this Award Agreement, including, without limitation, the power to (i) interpret the Plan and the terms of this Award Agreement; (ii) determine the reason for termination of employment; (iii) determine application of the post-employment obligations and cancellation and recovery provisions; (iv) decide all claims arising with respect to this award; and (v) delegate such authority as it deems appropriate. Any determination contemplated hereunder by the Committee, the Firm, the Director of Human Resources or their respective delegates or nominees shall be binding on all parties.

Notwithstanding anything herein to the contrary, the determinations of the Director of Human Resources, the Firm, the Committee and their respective delegates and nominees under the Plan and the Award Agreements are not required to be uniform. By way of clarification, the Committee, the Firm, the Director of Human Resources and their respective delegates and nominees shall be entitled to make non-uniform and selective determinations and modifications under Award Agreements and the Plan.

Amendment: The Committee or its nominee reserves the right to amend this Award Agreement in any manner, at any time and for any reason; provided, however, that no such amendment shall materially adversely affect your rights under this Award Agreement without your consent except

to the extent that the Committee or its delegate considers advisable to (x) comply with applicable laws or changes in or interpretation of applicable laws, regulatory requirements and accounting rules or standards and/or (y) make a change in a scheduled vesting date or impose the restrictions described above under “No Ownership Rights/Other Limitations”, in either case, to the extent permitted by Section 409A of the Code if it is applicable to you. This Award Agreement may not be amended except in writing signed by the Director of Human Resources of JPMorgan Chase.

Severability: If any portion of the Award Agreement is determined by the Firm to be unenforceable in any jurisdiction, any court or arbitrator of competent jurisdiction or the Director of Human Resources may reform the relevant provisions (e.g., as to length of service, time, geographical area or scope) to the extent the Firm (or court/arbitrator) considers necessary to make the provision enforceable under applicable law.

Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity: Upon receipt of satisfactory evidence that applicable United States federal, state, local, foreign or supranational ethics or conflict of interest laws or regulations require you to divest your interest in JPMorgan Chase PSUs, the Firm may accelerate the distribution of all or part of your outstanding award, including Reinvested Dividend Equivalent Share Units, effective on or before the required divestiture date and waive the Holding Requirement; provided that no accelerated distribution shall occur if the Firm determines that such acceleration will violate Section 409A of the Code. Accelerated distribution under this paragraph does not impact the dates as set forth in the “Recovery” section above. The time period for recovery shall be determined by the originally scheduled vesting date or distribution date prior to any acceleration event.

If you have voluntarily terminated your employment and have satisfied the requirements of the section captioned “Government Office Requirements”, acceleration shall apply (to extent required) to the percentage of your outstanding award that would continue to vest under that section. In the case of a termination of employment where the award is outstanding as a result of the subsections entitled “Job Elimination” or “Full Career Eligibility”, then acceleration shall apply, to the extent required, to the full outstanding award. Subject to the two foregoing sections, the number of shares of Common Stock to be received on acceleration shall be determined using the methodology set forth under the section captioned “Death”.

To the extent you have vested shares under this award subject to the Holding Requirement and become subject to divestiture requirement as forth herein, the Firm may waive the holding period to the extent required.

Notwithstanding an accelerated distribution or waiver of the Holding Requirement pursuant to the foregoing, you will remain subject to the applicable terms of your Award Agreement as if your award had remained outstanding for the duration of the original vesting period and shares had been distributed as scheduled as of the vesting date, including, but not limited to, repayment obligations set forth in the section captioned “Remedies” and the employment restrictions in the sections captioned “Protection-Based Vesting” and “Government Office Requirements” and the subsection “Full Career Eligibility”.

Use of Personal Data: By accepting this award, you acknowledge that the Firm may process your personal data for the purposes of providing you this award (to include registration of shares and units or establishing a brokerage account on your behalf) and disclosing to third parties, such as service providers or tax and regulatory authorities (e.g., for compensation reporting and payroll tax withholding purposes). Additionally, you agree that the Firm may transfer your personal data to jurisdictions that do not afford protections equivalent to the protections in the country in which we collected your data. Where applicable law provides a right to terminate the foregoing authorization, you may do so at any time, except with respect to tax and regulatory reporting and the Firm’s legal and regulatory obligations. In the event you terminate this authorization, your award will be cancelled.

Governing Law: This award shall be governed by and construed in accordance with the laws of the State of New York, without regard to conflicts of law principles.

Choice of Forum: By accepting this award under the Plan, you agree (and have agreed) that to the extent not otherwise subject to arbitration under an arbitration agreement between you and the Firm, any dispute arising directly or indirectly in connection with this award or the Plan shall be submitted to arbitration in accordance with the rules of the American Arbitration Association if so elected by the Firm in its sole discretion. In the event such a dispute is not subject to arbitration for any reason, you agree to accept the exclusive jurisdiction and venue of the United States District Court for the Southern District of New York with respect to any judicial proceeding in connection with this award or the Plan. You waive, to the fullest extent permitted by law, any objection to personal jurisdiction or to the laying of venue of such dispute and further agree not to commence any action arising out of or relating to this award or the Plan in any other forum.

Waiver of Jury Trial/Class Claims: By accepting this award, you agree, with respect to any claim brought in connection with your employment with the Firm in any forum (i) to waive the right to a jury trial and (ii) that any judicial proceeding or arbitration claim will be brought on an individual basis, and you hereby waive any right to submit, initiate, or participate in a representative capacity or as a plaintiff, claimant or member in a class action, collective action, or other representative or joint action.

Litigation: By accepting any award under the Plan, you agree (and have agreed) that in any action or proceeding by the Firm (other than a derivative suit in the right of the Firm) to enforce the terms and conditions of this Award Agreement or any other Award Agreement where the Firm is the prevailing party, the Firm shall be entitled to recover from you its reasonable attorney fees and expenses incurred in such action or proceeding. In addition, you agree that you are not entitled to, and agree not to seek, advancement of attorney fees and indemnification under the Firm’s By-Laws in the event of such a suit by the Firm.

Non-transferability: Neither this award or any other outstanding awards of restricted stock units or of performance based share units, nor your interests or rights in any such awards, shall be assigned, pledged, transferred, hedged, hypothecated or subject to any lien. An award may be transferred following your death by will, the laws of descent or by a beneficiary designation on file with the Firm.

Definitions

“Average Tangible Common Equity” means annual average common stockholders’ equity less annual average goodwill and annual average identifiable intangible assets. Annual averages of the components of Average Tangible Common Equity will be calculated using quarterly balances as reported in publically available financial disclosures. In the event that quarterly balances are not available, annual year end balances will be used. **This calculation is used solely for purposes of the Performance Ranking.**

“Award Payout Percentage” means the applicable percentage specified in the footnote to the Performance Table.

“Calculated PSUs” means the number of PSUs determined by multiplying the Target Award Number (after giving effect to any cancellation thereof, in whole or in part) by the Award Payout Percentage corresponding to the Firm’s Performance Ranking based on the three-year average performance for the Performance Period (both percentage and ranking, as set forth in the footnote to the Performance Table); provided that if the average of the Firm’s Reported ROTCE for the Performance Period either equals or exceeds ___% or is less than ___% (without taking into account any rounding conventions used), ___ percent or ___, respectively as the case may be, shall be substituted for the Performance Period’s Award Payout Percentage in calculating the number of PSUs to distribute. For avoidance of doubt, any cancellation of this award (in whole or in part) during the Performance Period will reduce the Target Award Number.

“Calculation Agent” means a third party entity not owned or controlled by the Firm, such as an accounting or consulting firm, retained from time to time by the Director of Human Resources or his/her delegate.

“Cause” means a determination by the Firm that your employment terminated as a result of your (i) violation of any law, rule or regulation (including rules of self-regulatory bodies) related to the Firm’s business, (ii) indictment or conviction of a felony, (iii) commission of a fraudulent act, (iv) violation of the JPMorgan Chase Code of Conduct or other Firm policies or misconduct related to your duties to the Firm (other than immaterial and inadvertent violations or misconduct), (v) grossly inadequate performance of the duties associated with your position or job function or failure to follow reasonable directives of your manager, or (vi) any act or failure to act that is injurious to the interests of the Firm or its relationship with a customer, client or an employee.

“Financial Services Company” means a business enterprise that engages in any of the following services (itself or through an affiliate or subsidiary), regardless of whether such services are the principle strategy or revenue-generating activity:

- commercial or retail banking, including, but not limited to, commercial, institutional and personal trust, custody and/or lending and processing services, internet banking, originating and servicing mortgages, issuing and servicing credit cards, payment servicing or processing or merchant services,
- insurance, including but not limited to, guaranteeing against loss, harm, damage, illness, disability or death, providing and issuing annuities, acting as principal, agent or broker for purpose of the forgoing,
- financial, investment or economic advisory services, including but not limited to, investment banking services (such as advising on mergers or dispositions, underwriting, dealing in, or making a market in securities or other similar activities), brokerage services, investment management services, asset management services, foreign exchange services, interbank networks and hedge funds,
- issuing, trading or selling instruments representing interests in pools of assets or in derivatives instruments,
- financial technology (“Fintech”) companies, such as those selling blockchain services, or offering or selling financial products/services,
- advising on, or investing in, private equity or real estate funds or ventures, or
- any similar activities that the Director of Human Resources or nominee determines in his or her sole discretion constitute financial services.

“Firm Reported ROTCE” means the Firm’s percentage return on tangible common equity for each year in the Performance Period (as calculated for use in its publicly available year-end financial disclosures without taking into account any rounding conventions used for financial reporting purposes).

“Firmwide Financial Threshold” means a cumulative return on tangible common equity for calendar years 20___, 20___ and 20___ of not less than ___%. Cumulative return on tangible common equity means (i) the sum of the Firm’s reported net income for all three calendar years, divided by (ii) reported year-end tangible equity averaged over the three years.

“Government Office” means (i) a full-time position in an elected or appointed office in local, state, or federal government (including equivalent positions outside the U.S. or in a supranational organization), not reasonably anticipated to be a full-career position, or (ii) conducting a bona fide full-time campaign for such an elective public office after formally filing for candidacy, where it is customary and reasonably necessary to campaign full-time for the office.

“Line of Business” means a business unit of the Firm (or one or more business units designated below under the definition “Line of Business Financial Threshold” of the Corporate Investment Bank). All Corporate Functions (including the functions of the Chief Investment Office) are considered a single Line of Business.

“Line of Business Financial Threshold” means the financial threshold set forth below: for the following Lines of Business based on the Firm’s management reporting system:

Asset & Wealth Management	Annual negative pre-tax pre-provision income ¹
Card and Auto	Annual negative pre-tax pre-loan loss reserve income ²
Commercial Banking	Annual negative pre-tax pre-loan loss reserve income ²
Corporate Investment Bank	Annual negative pre-tax pre-provision income ¹ for CIB overall and/or annual negative allocated product revenues (excluding XVA) for: <ul style="list-style-type: none"> • Fixed Income • Equities • Securities Services • Global Investment Banking • Payments
Consumer Banking, U.S. Wealth Management and Business Banking	Annual negative pre-tax pre-loan loss reserve income ²
Corporate Functions (including Chief Investment Office)	Annual negative pre-tax pre-provision income ¹ at the Firm level
Home Lending	Annual negative pre-tax pre-loan loss reserve income ²
¹ Pre-tax pre-provision income means Revenue less Expenses	
² Pre-tax pre-loan loss reserve income means Revenue less (Expenses plus Net Charge-offs)	

“Not-for-Profit Organization” means an entity exempt from tax under state law and under Section 501(c)(3) of the Code. Section 501(c)(3) only includes entities organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals. Not-for-Profit Organization shall also mean entities outside the United States exempt from local and national tax laws because they are organized and operated exclusively for purposes identical to those applicable to Section 501(c)(3) organization.

“Performance Companies” mean the following institutions which have business activities that overlap with a significant portion of the Firm’s revenue mix: _____ and _____.

If, during the Performance Period, one or more Performance Companies shall merge, engage in a spin-off or otherwise experience a material change in its revenue mix or business activities or its existence or its primary businesses shall terminate or cease due to receivership, bankruptcy, sale, or otherwise, then the Committee may eliminate such institution from the list of Performance Companies or make such other equitable adjustments, such as adding an acquirer or a new company to the list of Performance Companies, as it deems appropriate, with any such changes having effect for purposes of all calculations hereunder on a prospective basis from the date the applicable change is made.

“Performance Period” means calendar years 20___, 20___ and 20___.

“Performance Ranking” means the ranking of the average ROTCE of the Firm as compared to the ranking of the average ROTCE of the Performance Companies as specified in the footnote to the Performance Table for the Performance Period.

“Performance Table” means the table used in the calculation of PSUs for the Performance Period as set forth below:

Firm Reported ROTCE (average performance)	Award Payout Percentage	Performance Ranking ¹ (average performance)	Award Payout Percentage ¹
? ___%	___%	_____	___% to ___%
___% to ___%	Pay by relative ROTCE scale	_____	___% to ___%
< ___%	___%	_____	___% to ___%
		_____	___% to ___%

- The following sets forth the precise Award Payout Percentage corresponding to the Firm’s Performance Ranking (when compared to Performance Companies): #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; etc.

If, after the calculation of the Performance Ranking, there is a tie, the tie shall be disregarded for purposes of determining the Award Payout Percentage. For example, in the case of a tie for the _____ ranking between the Firm and a Performance Company, the Firm shall be treated as having satisfied that ranking. In the case of that same tie among Performance Companies, the _____ and _____ rankings will be deemed to have been satisfied.

“Recognized Service” means the period of service as an employee set forth in the Firm’s applicable service-related policies.

“ROTCE” means for the Firm and each of the Performance Companies a percentage derived by, for each year in the Performance Period, dividing (i) annual earnings from continuing operations less dividends on preferred stock as set forth in published financial disclosures by (ii) the Average Tangible Common Equity for the year. If, prior to the end of the vesting period, the Firm or any Performance Company restates its published financial statements for any year in the Performance Period, ROTCE for that year shall be recalculated for the Firm or Performance Company with the Performance Ranking adjusted, if necessary. This calculation is used solely for purposes of the Performance Ranking.

“Target Award Number” means the number of PSUs designated as such in the Award Agreement.

Government Office Requirements

You may be eligible to continue vesting in all or part of your award if you voluntarily resign to accept a Government Office (as defined above) or to become a candidate for an elective Government Office.

Full Career Eligibility:

“Government Office Requirements” does not apply to you if you satisfy the subsection captioned “--Full Career Eligibility” as of the date that you voluntarily terminate your employment with the Firm.

Eligibility:

Eligibility for continued vesting is conditioned on your providing the Firm:

- At least 60 days’ advance written notice of your intention to resign to accept or pursue a Government Office (see section captioned “Definitions”), during which period you must perform in a cooperative and professional manner services requested by the Firm and not provide services for any other employer. The Firm may elect to shorten this notice period at the Firm’s sole discretion.
- Confirmation, in a form satisfactory to the Firm, that vesting in this award pursuant to this provision would not violate any applicable law, regulation or rule.
- Documentation in a form satisfactory to the Firm that your resignation is for the purpose of accepting a Government Office or becoming a candidate for a Government Office. (See section captioned “Definitions”.)

Portion of Your Award Subject to Continued Vesting:

Subject to the conditions below, the percentage of this award that will continue to vest in accordance with this award’s original schedule will be based on your years of continuous service completed with the Firm immediately preceding your termination date, as follows:

- 50% if you have at least 3 but less than 4 years of continuous service,
- 75% if you have at least 4 but less than 5 years of continuous service, or
- 100% if you have 5 or more years of continuous service.

The portion of this award subject to continued vesting above is referred to as the “CV Award” and the portion not subject to continued vesting will be cancelled as of the date your employment terminates.

Conditions for Continued Vesting of Award:

- You must remain in a non-elective Government Office for two or more years after your employment with the Firm terminates to be eligible to receive the CV Award; provided that if your non-elective Government Office is for a period less than two years, you will be eligible to receive the CV Award if it has a vesting date during your period of Government Service; or
- In the case of resignation from the Firm to campaign for an elective Government Office, your name must be on the primary or final public ballot for the election. (If you are not elected, see below for employment restrictions.)

For avoidance of doubt, the performance criteria and protection based vesting set forth in these terms and conditions continue to apply to a CV Award.

Satisfaction of Conditions:

If your service in a Government Office ends two years or more after your employment with the Firm terminates, or in the case of resignation from the Firm to campaign for a Government Office, your name is on the primary or final public ballot for the election and you are not elected, any CV Awards then outstanding and any such awards that would have then been outstanding but for an accelerated distribution of shares (as described in the subsection captioned “--Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”) will be subject for the remainder of the applicable vesting period to the same terms and conditions of this Award Agreement, including employment restrictions during the vesting period, as if you had resigned from the Firm having met the requirements for Full Career Eligibility.

Failure to Satisfy Conditions:

If you do not satisfy the above “Conditions for Continued Vesting of Awards”, any outstanding PSUs under the CV Award will be cancelled. You also will be required to repay the Fair Market Value of the number of shares (before tax and other withholdings) of Common Stock distributed to you that would have been outstanding as PSUs on the date you failed to satisfy the “Conditions for Continued Vesting of Award” but for their accelerated distribution (as described in subsection captioned, “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”). Fair Market Value for this purpose will be determined as the date that the shares were distributed.

JPMORGAN CHASE & CO. LONG-TERM INCENTIVE PLAN
TERMS AND CONDITIONS OF _____, 20__
PERFORMANCE SHARE UNIT AWARD
OPERATING COMMITTEE
(Protection-Based Vesting Provisions)

Award Agreement

These terms and conditions are made part of the Award Agreement dated as of _____, 20__ (“Grant Date”) awarding performance share units (“PSUs”) pursuant to the terms of the JPMorgan Chase & Co. Long-Term Incentive Plan (“Plan”). To the extent the terms of the Award Agreement (all references to which will include these terms and conditions) conflict with the Plan, the Plan will govern. The Award Agreement, the Plan and Prospectus supersede any other agreement, whether written or oral, that may have been entered into by the Firm and you relating to this award.

This award was granted on the Grant Date subject to the Award Agreement and Plan. **Unless you decline by the deadline and in the manner specified in the Award Agreement, you will have agreed to be bound by these terms and conditions, effective as of the Grant Date.** If you decline the award, it will be cancelled as of the Grant Date.

Capitalized terms that are not defined in “Definitions” below or elsewhere in the Award Agreement will have the same meaning as set forth in the Plan.

JPMorgan Chase & Co. will be referred to throughout the Award Agreement as “JPMorgan Chase”, and together with its subsidiaries as the “Firm”.

Form and Purpose of Award

Each PSU represents a non-transferable right to receive one share of Common Stock following each vesting date as set forth in your Award Agreement.

The purpose of this award is to further emphasize sustained long-term performance and to align your interests with those of the Firm and its shareholders.

Protection-Based Vesting

This award is intended and expected to vest on each vesting date set forth in your Award Agreement, provided that you are continuously employed by the Firm through such vesting date, or you meet the requirements for continued vesting described under the subsections “--Job Elimination”, “--Full Career Eligibility”, “--Government Office” or “--Disability”. However, vesting and the number of PSUs that will vest are subject to these terms and conditions (including, but not limited to, sections captioned “Number of Performance Share Units at the end of Performance Period”, “Capital Ratio Performance Threshold”, “Recapture Provisions”, “Remedies” and the following protection-based vesting provision).

Up to a total of fifty percent of your award that would otherwise be distributable to you as of any vesting date (“At Risk PSUs”) may be cancelled if the Chief Executive Officer of JPMorgan Chase (“CEO”) determines in his or her sole discretion that cancellation of all or portion of the At Risk PSUs is appropriate in light of any one or a combination of the following factors:

- Your performance in relation to the priorities for your position, or the Firm’s performance in relation to the priorities for which you share responsibility as a member of the Operating Committee, have been unsatisfactory for a sustained period of time. Among the factors the CEO may consider in assessing performance are: net income, total net revenue, earnings per share and capital ratios of the Firm, both on an absolute basis and, as appropriate, relative to peer firms.
- For any calendar year ending during the vesting period, JPMorgan Chase’s annual pre-tax pre-provision income at the Firm level is negative.
- RSU awards granted to participants in a Line of Business for which you exercise, or during the vesting period exercised, direct or indirect responsibility, were in whole or in part cancelled because the Line of Business did not meet its annual Line of Business Financial Threshold.
- The Firm does not meet the Firmwide Financial Threshold.

For avoidance of doubt, cancellation of the At Risk PSUs, in whole or part, for one or more of the above factors may occur prior to the end of the Performance Period and the maximum number of At Risk PSUs subject to cancellation prior to the end of the Performance Period will be up to fifty percent of the Target Award Number.

In the event that your employment terminates due to “Job Elimination”, “Full Career Eligibility”, “Government Office” or “Disability” thereby entitling you to continued vesting in your award, (or potentially acceleration due to satisfaction of the Government Office Requirements), the cancellation circumstances described above will continue to apply.

Any determination above with respect to protection-based vesting provisions is subject to ratification by the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase (“Committee”). In the case of an award to any current or former CEO, all such determinations shall be made by the Committee and ratified by the Board.

Number of Performance Share Units at End of Performance Period

Subject to any cancellation in whole or part of your award pursuant to these terms and conditions:

Performance calculation: The number of PSUs at the end of the Performance Period will be derived by multiplying the Target Award Number by the Award Payout Percentage determined using the Performance Table.

The number of PSUs determined above will be subject to the Qualitative Performance Factor (as detailed below), which if the Committee determines that such an adjustment is appropriate, will be applied following the end of each year during the Performance Period, to adjust downward one-third of the Target Award Number of PSUs for each calendar year in the Performance Period. Additionally, the Committee, in its discretion, may make a qualitative performance assessment based on the entire three year Performance Period and apply the Qualitative Performance Factor to the entire number of PSUs determined above.

See sections captioned “[Calculation of Performance Ranking](#)” and “[Definitions](#)”.

Delivery of vested shares of common stock to your account will be made not later than the date specified in the last sentence of the subsection captioned “Section 409A Compliance”.

Reinvested Dividend Equivalent Share Units

This award is not eligible for reinvested dividend equivalent share units.

Holding Requirement

The net number of shares of Common Stock (after tax and all other lawful withholdings) in which you have vested, if any, as of the vesting date will be held in an account in your name with restrictions preventing you from transferring, assigning, hedging, selling, pledging or otherwise encumbering such shares for (i) a twelve month period measured from each vesting date; and (ii) a two year period for such shares vesting on _____, 20__, with the holding periods running concurrently. Such restrictions shall only lapse, prior to the expiration of the two year holding period, in the event of your death or for an accelerated distribution for ethics or conflict reasons. See section captioned, “[Death](#)” and subsection captioned, “Accelerated Distribution for Ethics or Conflict Reasons Resulting from Employment by a Government Entity”.

Calculation of Performance Ranking

For purposes of the Performance Ranking, the ranking of the Firm and of each Performance Company for the Performance Period shall be determined and calculated by the Calculation Agent, using the definitions of “Average Tangible Common Equity” (if otherwise applicable), “Calculated PSUs”, “Firm Reported ROTCE”, “Performance Table” (including its footnote) and “ROTCE” as set forth in the “[Definitions](#)” section of these terms and conditions. See section captioned “[Definitions](#)”. Except for Firm Reported ROTCE, calculations will be expressed as a decimal to the second place (i.e. xx.yy%), rounded to the nearest hundredth. See section captioned, “[Definitions](#)--Performance Table” in the event of a tie. All performance based calculations as set forth herein are binding and conclusive on you and your successors.

Capital Ratio Performance Threshold

Unvested PSUs are subject to reduction if the Firm’s Common Equity Tier 1 (CET1) capital ratio at any year end falls below a predetermined threshold of ____%.

If the Firm’s CET1 capital ratio at any year end during the Performance Period is below this predetermined threshold, up to one-third of the Target Award Number of PSUs will be subject to downward adjustment by the CMDC for each such year.

Qualitative Performance

Determination of Qualitative Performance Factor. Annually during the Performance Period, the Committee will formally assess your qualitative performance based on four broad categories: (1) Client/Customer Focus; (2) Risk, Controls & Conduct; (3) Teamwork & Leadership; and (4) Business Results. If the Committee determines that your performance “Meets” expectations, no downward adjustment to one-third of the Target Award Number of PSUs for that year shall take place (and the Qualitative Performance Factor shall be 100%). If the Committee determines that your performance did “Not Meet” expectations, the Committee shall determine whether a downward adjustment is appropriate, and if so, to what extent. A downward adjustment could result in a Qualitative Performance Factor of between 0% and 99%, depending on the circumstances. During the Performance Period, a 0% Performance Factor for each year in the Performance Period would reduce your Target Award Number of PSUs to zero, resulting in the cancellation of award with no shares vesting.

Additionally, the Committee may, in its sole discretion, make such assessment of your qualitative performance based on your performance during the entire three year Performance Period and apply the Qualitative Performance Factor to the entire number of PSUs determined under section captioned “Number of Performance Share Units at End of the Performance Period”. In the case of a Qualitative Performance Factor of 0%, the award would be cancelled.

The assessment will have regard to feedback solicited from the Chair of the UK Remuneration Committee to incorporate qualitative performance against local regulatory responsibilities as a “Senior Manager” of the relevant CIB UK-regulated entities.

The Qualitative Performance Factor shall only be applied, if applicable, in respect of a period of your employment with the Firm, or as soon as administratively practical.

Bonus Recoupment

In consideration of the grant of this award, you agree that you are subject to the JPMorgan Chase Bonus Recoupment Policy (or successor policy) as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 20__ and to this award. You can access this policy as currently in effect by clicking the following link to the JPMorgan Chase & Co. Corporate Governance Principles web page and scrolling to the Bonus Recoupment Policy located under the section titled "Other Matters":

<https://about.jpmorganchase.com/about/governance/corporate-governance-principles>

For the avoidance of doubt, nothing in these terms and conditions in any way limits the rights of the Firm under the JPMorgan Chase Bonus Recoupment Policy (or successor policy).

EMEA Malus and Clawback Policy - Identified Staff

In consideration of grant of this award, and without prejudice to any other provision of this Award Agreement, you agree that you are subject to the JPMorgan Chase EMEA Malus and Clawback Policy - Identified Staff (and any applicable supplement(s) to that policy) or successor policy as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year ____ and to this award.

The provisions of the JPMorgan Chase EMEA Malus and Clawback Policy - Identified Staff set out the terms and conditions applying to the grant of this award which ensure that the Firm is able to meet its regulatory obligations to operate malus (reduce) and/or clawback (recover) to awards in certain circumstances. These include, but are not limited to, where (i) there is a material downturn in the Firm's financial performance or (ii) where the Firm is required to hold more capital. The circumstances in which the events at (i) and (ii) would occur are analogous to some of the circumstances considered under the existing Firmwide terms and conditions, in particular the Bonus Recoupment Policy and the Protection Based Vesting provisions.

You can access this policy as currently in effect in My Rewards through the following link: <https://myrewards.jpmorganchase.com>

Recapture Provisions (Detrimental Conduct, Risk-Related and Other Recapture Provisions)

Notwithstanding any terms of this Award Agreement to the contrary, JPMorgan Chase reserves the right in its sole discretion to cancel up to 100% of your award and, to the extent set forth in "Remedies" below, to recover from you up to an amount equal to the Fair Market Value (determined as of any vesting date) of the gross number of shares of Common Stock previously distributed (including vested shares subject to the Holding Requirements and shares withheld for tax or other lawful purposes) under this award if the Firm in its sole discretion determines that:

- you engaged in conduct detrimental to the Firm insofar as it causes material financial or reputational harm to the Firm or its business activities, or
- this award was based on materially inaccurate performance metrics, whether or not you were responsible for the inaccuracy, or
- this award was based on a material misrepresentation by you, or
- you improperly or with gross negligence failed to identify, raise or assess, in a timely manner and as reasonably expected, risks and/or concerns with respect to risks material to the Firm or its business activities, or
- your employment was terminated for Cause (see section captioned "Definitions" below) or, in the case of a determination after the termination of your employment, that your employment could have been terminated for Cause.

See section captioned "Remedies" for additional information.

Termination of Employment

Except as explicitly set forth below under the subsections captioned "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability" or under the section captioned "Death", this award will be cancelled in full effective on the date your employment with the Firm terminates for any reason.

Subject to these terms and conditions (including, but not limited to, sections captioned "Protection-Based Vesting", "Bonus Recoupment", "EMEA Malus and Clawback Policy - Identified Staff", "Recapture Provisions", "Your Obligations" and "Remedies") you will be eligible to continue to vest (as you otherwise would vest if you were still employed by JPMorgan Chase) with respect to your award in accordance with its terms and conditions following the termination of your employment if one of the following circumstances applies to you:

- **Job Elimination**

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- the Firm terminated your employment because your job was eliminated, and

- after you are notified that your job will be eliminated, you provided such services as requested by the Firm in a cooperative and professional manner, and
- you satisfied the Release/Certification Requirements set forth below.

• Full Career Eligibility

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- you voluntarily terminated your employment with the Firm, had completed at least five years of continuous service with the Firm immediately preceding your termination date, and
- your Recognized Service (as defined below) on your date of termination equaled or exceeded 15 years, or your combined Recognized Service with the Firm and external professional experience (as attested by you to the Firm) equaled or exceeded 30 years, and
- you provided at least 180 days advance written notice to the Firm of your intention to voluntarily terminate your employment under this provision, during which notice period you provided such services as requested by the Firm in a cooperative and professional manner and you did not perform any services for any other employer, and
- continued vesting shall be appropriate, which determination shall be made prior to your termination and will be based on your performance and conduct (before and after providing notice), and
- for 36 months from the date of grant of this award, you do not either perform services in any capacity (such as an employee, contractor, consultant advisor, or self-employed individual, whether paid or unpaid) for a Financial Services Company (as defined below) or work in your profession (whether or not for a Financial Services Company); provided that you may work for a government, education or Not-for-Profit Organization (as defined below), and
- you satisfied the Release/Certification Requirements set forth below.

After receipt of such advance written notice, the Firm may choose to have you continue to provide services during such 180-day period as a condition to continued vesting or shorten the length of the 180-day period at the Firm's sole discretion, but to a date no earlier than the date you would otherwise meet the service requirement.

Additional advance notice requirements may apply for employees subject to notice period policies. (See "Notice Period" below.)

• Government Office

In the event that you voluntarily terminate your employment with the Firm to accept a Government Office or become a candidate for an elective Government Office, as described at the end of these terms and conditions under the section captioned "Government Office Requirements". See also definition of Government Office in the section captioned "Definitions".

• Disability

In the event that

- your employment with the Firm terminates because (i) you are unable to return to work while you are receiving benefits under the JPMorgan Chase Long Term Disability Plan, or for non-U.S. employees, under the equivalent JPMorgan Chase-sponsored local country plan (in either case, "LTD Plan"), or (ii) if you are not covered by a LTD Plan, you are unable to return to work due to a long-term disability that would qualify for benefits under the applicable LTD Plan, as determined by the Firm or a third-party designated by the Firm; provided that you (x) request in writing continued vesting due to such disability within 30 days of the date your employment terminates, and (y) provide any requested supporting documentation and (z) receive the Firm's written consent to such treatment, and
- you satisfied the Release/Certification Requirements set forth below.

Release/Certification

To qualify for continued vesting after termination of your employment under any of the foregoing circumstances:

- you must timely execute and deliver a release of claims in favor of the Firm, having such form and terms as the Firm shall specify,
- with respect to Full Career Eligibility, prior to the termination of your employment, you must confirm with management that you meet the eligibility criteria (including providing at least 180 days advance written notification), advise that you are seeking to be treated as an individual eligible for Full Career Eligibility, and receive written consent to such continued vesting,
- with respect to "Full Career Eligibility" and "Government Office", it is your responsibility to take the appropriate steps to certify to the Firm prior to each vesting date while the employment restrictions are outstanding on the authorized form of the Firm that you have complied with the employment restrictions applicable to you (as described herein) from your date of termination of employment through the applicable vesting date,
- with respect to Disability, you must satisfy the notice and documentation described above and receive written consent to such continued vesting, and
- in all cases, otherwise complied with all other terms of the Award Agreement. (See section captioned "Your Obligations" below.)

Death

If you die while you are eligible to vest in this award, your designated beneficiary on file with the Firm's Stock Administration Department (or your estate or if no beneficiary has been designated or survives you or if beneficiary designation is not recognized by local legislation) may be entitled to receive a distribution of a number of shares of Common Stock associated with your award.

Should you die after the end of the Performance Period, your beneficiary will receive shares of Common Stock equal to any outstanding PSUs.

Should you die during the Performance Period, your Beneficiary will receive shares of Common Stock based on the average performance of all completed calendar years, multiplied by one-third of the Target Award Number of PSUs for each completed calendar year in the Performance Period, and using the Award Payout Percentage equal to 100 percent for any remaining calendar years in the Performance Period.

Any shares will be distributed no later than the end of the calendar year immediately following the calendar year which contains your date of death; however, our administrative practice is to register such shares in the name of your beneficiary or estate within 60 days of the Firm's receipt of any required documentation.

Your Obligations

In consideration of the grant of this award, you agree to comply with and be bound by the obligations set forth below next to the subsections captioned "--Non-Solicitation of Employees and Customers", "--Confidential Information", "--Non-Disparagement", "--Cooperation", "--Compliance with Award Agreement", and "--Notice Period".

- **Non-Solicitation of Employees and Customers**

During your employment by the Firm and for the longer of the (i) one year period following the termination of your employment or, (ii) if your award is not cancelled as of your termination date, the three year period from Grant Date, you will not directly or indirectly, whether on your own behalf or on behalf of any other party, without the prior written consent of the Director of Human Resources: (i) solicit, induce or encourage any of the Firm's then current employees to leave the Firm or to apply for employment elsewhere, unless such current employee has received official, written notice that his or her employment will be terminated due to job elimination (ii) hire any employee or former employee who was employed by the Firm at the date your employment terminated, unless the individual's employment terminated because his or her job was eliminated, or the individual's employment with the Firm has been terminated for more than six months, (iii) to the fullest extent enforceable under applicable law, solicit or induce or attempt to induce to leave the Firm, or divert or attempt to divert from doing business with the Firm, any then current customers, suppliers or other persons or entities that were serviced by you or whose names became known to you by virtue of your employment with the Firm, or otherwise interfere with the relationship between the Firm and such customers, suppliers or other persons or entities. This does not apply to publicly known institutional customers that you service after your employment with the Firm without the use of the Firm's confidential or proprietary information.

These restrictions do not apply to authorized actions you take in the normal course of your employment with the Firm, such as employment decisions with respect to employees you supervise or business referrals in accordance with the Firm's policies.

- **Confidential Information**

You will not, either during your employment with the Firm or thereafter, directly or indirectly (i) use or disclose to anyone any confidential information related to the Firm's business, or (ii) communicate with the press or other media about matters related to the Firm, its customers or employees, including matters and activities relating to your employment, or the employment of others, by the Firm, in the case of either (i) or (ii), except as explicitly permitted by the JPMorgan Chase Code of Conduct and applicable policies or law or legal process. In addition, following your termination of employment, you will not, without prior written authorization, access the Firm's private and internal information through telephonic, intranet or internet means. "Confidential information" shall have the same meaning for the Award Agreement as it has in the JPMorgan Chase Code of Conduct.

Nothing in this award precludes you from reporting to the Firm's management or directors, the government, a regulator, a self-regulatory agency, your attorneys or a court, conduct you believe to be in violation of the law or concerns of any known or suspected Code of Conduct violation. It is also not intended to prevent you from responding truthfully to questions or requests from the government, a regulator or in a court of law.

- **Non-Disparagement**

You will not, either during your employment with the Firm or thereafter, make or encourage others to make any public statement or release any information in verbal, written, electronic or any other form, that is intended to, or reasonably could be foreseen to, disparage, embarrass or criticize the Firm or its employees, officers, directors or shareholders as a group. This shall not preclude you from reporting to the Firm's management or directors or to the government or a regulator conduct you believe to be in violation of the law or the Firm's Code of Conduct or responding truthfully to questions or requests for information to the government, a regulator or in a court of law in connection with a legal or regulatory investigation or proceeding.

- **Cooperation**

You will cooperate fully with and provide full and accurate information to the Firm and its counsel with respect to any matter (including any audit, tax proceeding, litigation, investigation or governmental proceeding) with respect to which you may have knowledge or information, subject to reimbursement for actual, appropriate and reasonable out-of-pocket expenses incurred by you.

- **Compliance with Award Agreement**

You will provide the Firm with any information reasonably requested to determine compliance with the Award Agreement, and you authorize the Firm to disclose the terms of the Award Agreement to any third party who might be affected thereby, including your prospective employer.

- **Notice Period**

If you are subject to a notice period or become subject to a notice period after the Grant Date, whether by contract or by policy, that requires you to provide advance written notice of your intention to terminate your employment (“Notice Period”), then as consideration for this award and continued employment, you will provide the Firm with the necessary advance written notice that applies to you, as specified by such contract or policy.

After receipt of your notice, the Firm may choose to have you continue to provide services during the applicable Notice Period or may place you on a paid leave for all or part of the applicable Notice Period. During the Notice Period, you shall continue to devote your full time and loyalty to the Firm by providing services in a cooperative and professional manner and not perform any services for any other employer and shall receive your base salary and certain benefits until your employment terminates. You and the Firm may mutually agree to waive or modify the length of the Notice Period.

Regardless of whether a Notice Period applies to you, you must comply with the 180-day advance notice period described under the subsection captioned “-- Full Career Eligibility” in the event you wish to terminate employment under that same subsection.

Remedies

- **Cancellation**

In addition to the cancellation provisions described under the sections captioned “Protection-Based Vesting”, “Qualitative Performance Factor”, “Bonus Recoupment”, “EMEA Malus and Clawback Policy - Identified Staff”, “Recapture Provisions” and “Termination of Employment”, your outstanding PSUs under this award may be cancelled if the Firm in its sole discretion determines that:

- you have failed to comply with any of the advance notice/cooperation requirements or employment restrictions applicable to your termination of employment, or
- you have failed to return the required forms specified under the section captioned “Release/Certification” by the specified deadline, or
- you have violated any of the provisions as set forth above in the section captioned “Your Obligations”.

To the extent provided under the subsection captioned “--Amendment” below, JPMorgan Chase reserves the right to suspend vesting of this award and/or distribution of shares under this award, including, without limitation, during any period that JPMorgan Chase is evaluating whether this award is subject to cancellation and/or recovery and/or whether the conditions for distributions of shares under this award are satisfied. The Firm is not responsible for any price fluctuations during any period of suspension and, if applicable, suspended units will be reinstated consistent with Plan administration procedures. See also “Administrative Provisions-No Ownership Rights/Other Limitations”.

- **Recovery**

In addition to cancellation of outstanding PSUs, you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date or acceleration date) of the gross number of shares of Common Stock previously distributed, including vested shares subject to the Holding Requirements, under this award as follows:

- Payment may be required with respect to any shares of Common Stock distributed within the three year period prior to a notice-of-recovery under this section, if the Firm in its sole discretion determines that:
 - you committed a fraudulent act, or engaged in knowing and willful misconduct related to your employment;
 - you violated any of the provisions as set forth above in the section captioned “Your Obligations,” or
 - you violated the employment restrictions set forth in the subsection “Full Career Eligibility” or “Government Office” following the termination of your employment.
- In addition, payment may be required with respect to any shares distributed within the one year period prior to notice-of-recovery under this section, if the Firm in its sole discretion determines appropriate pursuant to the provisions in the section captioned “Recapture Provisions”.

Notice-of-recovery under this subsection is a written (including electronic) notice from the Firm to you either requiring payment under this subsection or stating that JPMorgan Chase is evaluating requiring payment under this subsection. Without limiting the foregoing, notice-of-recovery will be deemed provided if the Firm makes a good faith attempt to provide written (including electronic) notice at your last known address maintained in the Firm’s employment records. For the avoidance of doubt, a notice-of-recovery that the Firm is evaluating requiring payment under this subsection shall preserve JPMorgan Chase’s rights to require payment as set forth above in all respects and the Firm shall be under no obligation to complete its evaluation other than as the Firm may determine in its sole discretion.

For purposes of this subsection, shares distributed under this award include shares withheld for tax purposes. However, it is the Firm’s intention that you only be required to pay the amounts under this subsection with respect to shares that are or may be retained by you following a determination of tax liability and that you will not be required to pay amounts with respect to shares representing irrevocable tax

withholdings or tax payments previously made (whether by you or the Firm) that you will not be able to recover, recapture or reclaim (including as a tax credit, refund or other benefit). Accordingly, JPMorgan Chase will not require you to pay any amount that the Firm or its nominee in his or her sole discretion determines is represented by such withholdings or tax payments.

Payment may be made in shares of Common Stock or in cash. You agree that any repayment will be a lawful recovery under the terms and conditions of your Award Agreement and is not to be construed in any manner as a penalty.

Nothing in the section in any way limits your obligations under “[Bonus Recoupment](#)” and “[EMEA Malus and Clawback Policy - Identified Staff](#)”.

- **Right to an Injunction**

You acknowledge that a violation or attempted violation of the obligations set forth herein will cause immediate and irreparable damage to the Firm, and therefore agree that the Firm shall be entitled as a matter of right to an injunction, from any court of competent jurisdiction, restraining any violation or further violation of such obligations; such right to an injunction, however, shall be cumulative and in addition to whatever other remedies the Firm may have under law or equity.

Administrative Provisions

Withholding Taxes: As a result of legal and/or tax obligations the Firm, in its sole discretion, may (i) retain from each distribution the number of shares of Common Stock required to satisfy applicable tax obligations or (ii) implement any other desirable or necessary procedures, so that appropriate withholding and other taxes are paid to the competent authorities with respect to the vested shares and the award. This may include but is not limited to (i) a market sale of a number of such shares on your behalf substantially equal to the withholding or other taxes, (ii) to the extent required by law, withhold from cash compensation, an amount equal to any withholding obligation with respect to the award and shares that vest under this award, and (iii) retaining shares that vest under this award until you pay any taxes associated with the award and vested shares directly to the competent authorities.

Right to Set Off: Although the Firm expects to settle this award in share(s) of Common Stock as of the applicable vesting date, as set forth in your Award Agreement, the Firm may, to the maximum extent permitted by applicable law (including Section 409A of the Code to the extent it is applicable to you), retain for itself funds or the Common Stock resulting from any vesting of this award to satisfy any obligation or debt that you owe to the Firm. Notwithstanding any account agreement with the Firm to the contrary, the Firm will not recoup or recover any amount owed from any funds or unrestricted securities held in your name and maintained at the Firm pursuant to such account agreement to satisfy any obligation or debt or obligation owed by you under this award without your consent. This restriction on the Firm does not apply to accounts described and authorized in “No Ownership Rights/Other Limitations” described below.

No Ownership Rights/Other Limitations: PSUs do not convey the rights of ownership of Common Stock and do not carry voting rights. No shares of Common Stock will be issued to you until after the number of PSUs have been determined, if any, and have vested. Shares will be issued in accordance with JPMorgan Chase’s procedures for issuing stock. By accepting this award, you authorize the Firm, in its sole discretion, to establish on your behalf a brokerage account in your name with the Firm or book-entry account with our stock plan administrator and/or transfer agent and deliver to that account any vested shares derived from the award. You also acknowledge that should there be a determination that the cancellation provisions of this award apply during the period when the vesting of any outstanding PSUs has been suspended, then you agree that such PSUs may be cancelled in whole or part. (See Sections captioned “[Protection-Based Vesting](#)”, “[Qualitative Performance Factor](#)”, “[Bonus Recoupment](#)”, “[EMEA Malus & Clawback Policy - Identified Staff](#)”, “[Recapture Provisions](#)”, “[Termination of Employment](#)” and “[Remedies](#)”, as well as the subsection captioned “--Amendment” permitting suspension of vesting.)

With respect to any applicable vesting date, JPMorgan Chase may impose for any reason, as of such vesting date for such period as it may specify in its sole discretion, such restrictions on the Common Stock to be issued to you as it may deem appropriate, including, but not limited to, restricting the sale, transfer, pledging, assignment, hedging or encumbrance of such shares of Common Stock. Such restrictions described in the last sentence shall not impact your right to vote or receive dividends with respect to the Common Stock. By accepting this award, you acknowledge that during such specified period should there be a determination that the recovery provisions of this award apply, then you agree that you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares subject to such restrictions (notwithstanding the limitation set forth in the “Right to Set Off” subsection above). (See sections captioned “[Bonus Recoupment](#)” and “[Remedies](#)”.)

Binding Agreement: The Award Agreement will be binding upon any successor in interest to JPMorgan Chase, by merger or otherwise.

Not a Contract of Employment: Nothing contained in the Award Agreement constitutes a contract of employment or continued employment. Employment is “at-will” and may be terminated by either you or JPMorgan Chase for any reason at any time. This award does not confer any right or entitlement to, nor does the award impose any obligation on the Firm to provide, the same or any similar award in the future and its value is not compensation for purposes of determining severance.

Section 409A Compliance: To the extent that Section 409A of the Code is applicable to this award, distributions of shares hereunder are intended to comply with Section 409A of the Code, and the Award Agreement, including these terms and conditions, shall be interpreted in a manner consistent with such intent.

Notwithstanding anything herein to the contrary, if you (i) are subject to taxation under the Code, (ii) are a specified employee as defined in the JPMorgan Chase 2005 Deferred Compensation Plan and (iii) have incurred a separation from service (as defined in that Plan with the exception of

death) and if any units/shares under this award represent deferred compensation as defined in Section 409A and such shares are distributable (under the terms of this award) within six months following, and as a result of your separation from service, then those shares will be delivered during the first calendar month after the expiration of six full months from date of your separation from service. Further, if your award is not subject to a substantial risk of forfeiture as defined by regulations issued under Section 409A of the Code, then the remainder of each calendar year immediately following each vesting date set forth in your Award Agreement shall be a payment date for purposes of distributing the vested portion of the award.

Change in Outstanding Shares: In the event of any change in the outstanding shares of Common Stock by reason of any stock dividend or split, recapitalization, issuance of a new class of common stock, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to stockholders of Common Stock other than regular cash dividends, the Committee will make an equitable substitution or proportionate adjustment, in the number or kind of shares of Common Stock or other securities issued or reserved for issuance pursuant to the Plan and to any PSUs outstanding under this award for such corporate events.

Other Equitable Adjustments: Except for the “Qualitative Performance Factor”, the Committee may make adjustments (up or down) to the award as it deems to be equitable, to maintain the intended economics of the award in light of changed circumstances, which may include unusual or non-recurring events affecting the Firm (or the Performance Companies) or its financial statements in each case resulting from changes in accounting methods, practices or policies, changes in capital structure by reason of legal or regulatory requirements and such other changed circumstances, as the Committee may deem appropriate.

Interpretation/Administration: The Committee has sole and complete authority to interpret and administer this Award Agreement, including, without limitation, the power to (i) interpret the Plan and the terms of this Award Agreement; (ii) determine the reason for termination of employment; (iii) determine application of the post-employment obligations and cancellation and recovery provisions; (iv) decide all claims arising with respect to this award; and (v) delegate such authority as it deems appropriate. Any determination contemplated hereunder by the Committee, the Firm, the Director of Human Resources or their respective delegates or nominees shall be binding on all parties.

Notwithstanding anything herein to the contrary, the determinations of the Director of Human Resources, the Firm, the Committee and their respective delegates and nominees under the Plan and the Award Agreements are not required to be uniform. By way of clarification, the Committee, the Firm, the Director of Human Resources and their respective delegates and nominees shall be entitled to make non-uniform and selective determinations and modifications under Award Agreements and the Plan.

Amendment: The Committee or its nominee reserves the right to amend this Award Agreement in any manner, at any time and for any reason; provided, however, that no such amendment shall materially adversely affect your rights under this Award Agreement without your consent except to the extent that the Committee or its delegate considers advisable to (x) comply with applicable laws or changes in or interpretation of applicable laws, regulatory requirements and accounting rules or standards and/or (y) make a change in a scheduled vesting date or impose the restrictions described above under “No Ownership Rights/Other Limitations”, in either case, to the extent permitted by Section 409A of the Code if it is applicable to you. This Award Agreement may not be amended except in writing signed by the Director of Human Resources of JPMorgan Chase.

Severability: If any portion of the Award Agreement is determined by the Firm to be unenforceable in any jurisdiction, any court or arbitrator of competent jurisdiction or the Director of Human Resources may reform the relevant provisions (e.g., as to length of service, time, geographical area or scope) to the extent the Firm (or court/arbitrator) considers necessary to make the provision enforceable under applicable law.

Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity: Upon receipt of satisfactory evidence that applicable United States federal, state, local, foreign or supranational ethics or conflict of interest laws or regulations require you to divest your interest in JPMorgan Chase PSUs, the Firm may accelerate the distribution of all or part of your outstanding award effective on or before the required divestiture date and waive the Holding Requirement; provided that no accelerated distribution shall occur if the Firm determines that such acceleration will violate Section 409A of the Code. Accelerated distribution under this paragraph does not impact the dates as set forth in the “Recovery” section above. The time period for recovery shall be determined by the originally scheduled vesting date or distribution date prior to any acceleration event.

If you have voluntarily terminated your employment and have satisfied the requirements of the section captioned “Government Office Requirements”, acceleration shall apply (to extent required) to the percentage of your outstanding award that would continue to vest under that section. In the case of a termination of employment where the award is outstanding as a result of the subsections entitled “Job Elimination” or “Full Career Eligibility”, then acceleration shall apply, to the extent required, to the full outstanding award. Subject to the two foregoing sections, the number of shares of Common Stock to be received on acceleration shall be determined using the methodology set forth under the section captioned “Death”.

To the extent you have vested shares under this award subject to the Holding Requirement and become subject to divestiture requirement as forth herein, the Firm may waive the holding period to the extent required.

Notwithstanding an accelerated distribution or waiver of the Holding Requirement pursuant to the foregoing, you will remain subject to the applicable terms of your Award Agreement as if your award had remained outstanding for the duration of the vesting period and shares had been distributed as scheduled as of each vesting date, including, but not limited to, repayment obligations set forth in the section captioned “Remedies” and the employment restrictions in the sections captioned “Protection-Based Vesting” and “Government Office Requirements” and the subsection “Full Career Eligibility”.

Use of Personal Data: By accepting this award, you acknowledge that the Firm may process your personal data for the purposes of providing you this award (to include registration of shares and units or establishing a brokerage account on your behalf) and disclosing to third parties, such as

service providers or tax and regulatory authorities (e.g., for compensation reporting and payroll tax withholding purposes). Additionally, you agree that the Firm may transfer your personal data to jurisdictions that do not afford protections equivalent to the protections in the country in which we collected your data. Where applicable law provides a right to terminate the foregoing authorization, you may do so at any time, except with respect to tax and regulatory reporting and the Firm's legal and regulatory obligations. In the event you terminate this authorization, your award will be cancelled.

Governing Law: This award shall be governed by and construed in accordance with the laws of the State of New York, without regard to conflicts of law principles.

Choice of Forum: By accepting this award under the Plan, you agree (and have agreed) that to the extent not otherwise subject to arbitration under an arbitration agreement between you and the Firm, any dispute arising directly or indirectly in connection with this award or the Plan shall be submitted to arbitration in accordance with the rules of the American Arbitration Association if so elected by the Firm in its sole discretion. In the event such a dispute is not subject to arbitration for any reason, you agree to accept the exclusive jurisdiction and venue of the United States District Court for the Southern District of New York with respect to any judicial proceeding in connection with this award or the Plan. You waive, to the fullest extent permitted by law, any objection to personal jurisdiction or to the laying of venue of such dispute and further agree not to commence any action arising out of or relating to this award or the Plan in any other forum.

Waiver of Jury Trial/Class Claims: By accepting this award, you agree, with respect to any claim brought in connection with your employment with the Firm in any forum (i) to waive the right to a jury trial and (ii) that any judicial proceeding or arbitration claim will be brought on an individual basis, and you hereby waive any right to submit, initiate, or participate in a representative capacity or as a plaintiff, claimant or member in a class action, collective action, or other representative or joint action.

Litigation: By accepting any award under the Plan, you agree (and have agreed) that in any action or proceeding by the Firm (other than a derivative suit in the right of the Firm) to enforce the terms and conditions of this Award Agreement or any other Award Agreement where the Firm is the prevailing party, the Firm shall be entitled to recover from you its reasonable attorney fees and expenses incurred in such action or proceeding. In addition, you agree that you are not entitled to, and agree not to seek, advancement of attorney fees and indemnification under the Firm's By-Laws in the event of such a suit by the Firm.

Non-transferability: Neither this award or any other outstanding awards of restricted stock units or of performance based share units, nor your interests or rights in any such awards, shall be assigned, pledged, transferred, hedged, hypothecated or subject to any lien. An award may be transferred following your death by will, the laws of descent or by a beneficiary designation on file with the Firm.

Definitions

"Average Tangible Common Equity" means annual average common stockholders' equity less annual average goodwill and annual average identifiable intangible assets. Annual averages of the components of Average Tangible Common Equity will be calculated using quarterly balances as reported in publically available financial disclosures. In the event that quarterly balances are not available, annual year end balances will be used. **This calculation is used solely for purposes of the Performance Ranking.**

"Award Payout Percentage" means the applicable percentage specified in the footnote to the Performance Table.

"Calculated PSUs" means the number of PSUs determined by multiplying the Target Award Number (after giving effect to any cancellation thereof, in whole or in part) by the Award Payout Percentage corresponding to the Firm's Performance Ranking based on the three-year average performance for the Performance Period (both percentage and ranking, as set forth in the footnote to the Performance Table); provided that if the average of the Firm's Reported ROTCE for the Performance Period either equals or exceeds ___% or is less than ___% (without taking into account any rounding conventions used), ___ percent or ___, respectively as the case may be, shall be substituted for the Performance Period's Award Payout Percentage in calculating the number of PSUs to distribute. For avoidance of doubt, any cancellation of this award (in whole or in part) during the Performance Period will reduce the Target Award Number.

"Calculation Agent" means a third party entity not owned or controlled by the Firm, such as an accounting or consulting firm, retained from time to time by the Director of Human Resources or his/her delegate.

"Cause" means a determination by the Firm that your employment terminated as a result of your (i) violation of any law, rule or regulation (including rules of self-regulatory bodies) related to the Firm's business, (ii) indictment or conviction of a felony, (iii) commission of a fraudulent act, (iv) violation of the JPMorgan Chase Code of Conduct or other Firm policies or misconduct related to your duties to the Firm (other than immaterial and inadvertent violations or misconduct), (v) grossly inadequate performance of the duties associated with your position or job function or failure to follow reasonable directives of your manager, or (vi) any act or failure to act that is injurious to the interests of the Firm or its relationship with a customer, client or an employee.

"Financial Services Company" means a business enterprise that engages in any of the following services (itself or through an affiliate or subsidiary), regardless of whether such services are the principle strategy or revenue-generating activity:

- commercial or retail banking, including, but not limited to, commercial, institutional and personal trust, custody and/or lending and processing services, internet banking, originating and servicing mortgages, issuing and servicing credit cards, payment servicing or processing or merchant services,
- insurance, including but not limited to, guaranteeing against loss, harm, damage, illness, disability or death, providing and issuing annuities, acting as principal, agent or broker for purpose of the foregoing,

- financial, investment or economic advisory services, including but not limited to, investment banking services (such as advising on mergers or dispositions, underwriting, dealing in, or making a market in securities or other similar activities), brokerage services, investment management services, asset management services, foreign exchange services, interbank networks and hedge funds,
- issuing, trading or selling instruments representing interests in pools of assets or in derivatives instruments,
- financial technology (“Fintech”) companies, such as those selling blockchain services, or offering or selling financial products/services,
- advising on, or investing in, private equity or real estate funds or ventures, or
- any similar activities that the Director of Human Resources or nominee determines in his or her sole discretion constitute financial services.

“**Firm Reported ROTCE**” means the Firm’s percentage return on tangible common equity for each year in the Performance Period (as calculated for use in its publicly available year-end financial disclosures without taking into account any rounding conventions used for financial reporting purposes).

“**Firmwide Financial Threshold**” means a cumulative return on tangible common equity for calendar years 20__, 20__ and 20__ of not less than __%. Cumulative return on tangible common equity means (i) the sum of the Firm’s reported net income for all three calendar years, divided by (ii) reported year-end tangible equity averaged over the three years.

“**Government Office**” means (i) a full-time position in an elected or appointed office in local, state, or federal government (including equivalent positions outside the U.S. or in a supranational organization), not reasonably anticipated to be a full-career position, or (ii) conducting a bona fide full-time campaign for such an elective public office after formally filing for candidacy, where it is customary and reasonably necessary to campaign full-time for the office.

“**Line of Business**” means a business unit of the Firm (or one or more business units designated below under the definition “Line of Business Financial Threshold” of the Corporate Investment Bank). All Corporate Functions (including the functions of the Chief Investment Office) are considered a single Line of Business.

“**Line of Business Financial Threshold**” means the financial threshold set forth below: for the following Lines of Business based on the Firm’s management reporting system:

Asset & Wealth Management	Annual negative pre-tax pre-provision income ¹
Card and Auto	Annual negative pre-tax pre-loan loss reserve income ²
Commercial Banking	Annual negative pre-tax pre-loan loss reserve income ²
Corporate Investment Bank	Annual negative pre-tax pre-provision income ¹ for CIB overall or annual negative allocated product revenues (excluding XVA) for: <ul style="list-style-type: none"> • Fixed Income • Equities • Securities Services • Global Investment Banking • Payments
Consumer Banking, U.S. Wealth Management and Business Banking	Annual negative pre-tax pre-loan loss reserve income ²
Corporate Functions (including Chief Investment Office)	Annual negative pre-tax pre-provision income ¹ at the Firm level
Home Lending	Annual negative pre-tax pre-loan loss reserve income ²
¹ Pre-tax pre-provision income means Revenue less Expenses	
² Pre-tax pre-loan loss reserve income means Revenue less (Expenses plus Net Charge-offs)	

“**Not-for-Profit Organization**” means an entity exempt from tax under state law and under Section 501(c)(3) of the Code. Section 501(c)(3) only includes entities organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals. Not-for-Profit Organization shall also mean entities outside the United States exempt from local and national tax laws because they are organized and operated exclusively for purposes identical to those applicable to Section 501(c)(3) organization.

“**Performance Companies**” mean the following institutions which have business activities that overlap with a significant portion of the Firm’s revenue mix: _____, and _____.

If, during the Performance Period, one or more Performance Companies shall merge, engage in a spin-off or otherwise experience a material change in its revenue mix or business activities or its existence or its primary businesses shall terminate or cease due to receivership, bankruptcy, sale, or otherwise, then the Committee may eliminate such institution from the list of Performance Companies or make such other equitable adjustments, such as adding an acquirer or a new company to the list of Performance Companies, as it deems appropriate, with any such changes having effect for purposes of all calculations hereunder on a prospective basis from the date the applicable change is made.

“**Performance Period**” means calendar years 20__, 20__ and 20__.

“Performance Ranking” means the ranking of the average ROTCE of the Firm as compared to the ranking of the average ROTCE of the Performance Companies as specified in the footnote to the Performance Table for the Performance Period.

“Performance Table” means the table used in the calculation of PSUs for the Performance Period as set forth below:

Firm Reported ROTCE (average performance)	Award Payout Percentage	Performance Ranking ¹ (average performance)	Award Payout Percentage ¹
? __%	__%	_____	__% to __%
__% to __%	Pay by relative ROTCE scale	_____	__% to __%
< __%	__%	_____	__% to __%
		_____	__% to __%

- The following sets forth the precise Award Payout Percentage corresponding to the Firm’s Performance Ranking (when compared to Performance Companies): #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; etc.

If, after the calculation of the Performance Ranking, there is a tie, the tie shall be disregarded for purposes of determining the Award Payout Percentage. For example, in the case of a tie for the ____ ranking between the Firm and a Performance Company, the Firm shall be treated as having satisfied that ranking. In the case of that same tie among Performance Companies, the ____ and ____ rankings will be deemed to have been satisfied.

“Recognized Service” means the period of service as an employee set forth in the Firm’s applicable service-related policies.

“ROTCE” means for the Firm and each of the Performance Companies a percentage derived by, for each year in the Performance Period, dividing (i) annual earnings from continuing operations less dividends on preferred stock as set forth in published financial disclosures by (ii) the Average Tangible Common Equity for the year. If, prior to the end of the vesting period, the Firm or any Performance Company restates its published financial statements for any year in the Performance Period, ROTCE for that year shall be recalculated for the Firm or Performance Company with the Performance Ranking adjusted, if necessary. This calculation is used solely for purposes of the Performance Ranking.

“Target Award Number” means the number of PSUs designated as such in the Award Agreement.

Government Office Requirements

You may be eligible to continue vesting in all or part of your award if you voluntarily resign to accept a Government Office (as defined above) or to become a candidate for an elective Government Office.

Full Career Eligibility:

“Government Office Requirements” does not apply to you if you satisfy the subsection captioned “--Full Career Eligibility” as of the date that you voluntarily terminate your employment with the Firm.

Eligibility:

Eligibility for continued vesting is conditioned on your providing the Firm:

- At least 60 days’ advance written notice of your intention to resign to accept or pursue a Government Office (see section captioned “Definitions”), during which period you must perform in a cooperative and professional manner services requested by the Firm and not provide services for any other employer. The Firm may elect to shorten this notice period at the Firm’s sole discretion.
- Confirmation, in a form satisfactory to the Firm, that vesting in this award pursuant to this provision would not violate any applicable law, regulation or rule.
- Documentation in a form satisfactory to the Firm that your resignation is for the purpose of accepting a Government Office or becoming a candidate for a Government Office. (See section captioned “Definitions”.)

Portion of Your Award Subject to Continued Vesting:

Subject to the conditions below, the percentage of this award that will continue to vest in accordance with this award’s original schedule will be based on your years of continuous service completed with the Firm immediately preceding your termination date, as follows:

- 50% if you have at least 3 but less than 4 years of continuous service,
- 75% if you have at least 4 but less than 5 years of continuous service, or
- 100% if you have 5 or more years of continuous service.

The portion of this award subject to continued vesting above is referred to as the “CV Award” and the portion not subject to continued vesting will be cancelled as of the date your employment terminates.

Conditions for Continued Vesting of Award:

- You must remain in a non-elective Government Office for two or more years after your employment with the Firm terminates to be eligible to receive the CV Award; provided that if your non-elective Government Office is for a period less than two years, you will be eligible to receive the CV Award if it has a vesting date during your period of Government Service; or
- In the case of resignation from the Firm to campaign for an elective Government Office, your name must be on the primary or final public ballot for the election. (If you are not elected, see below for employment restrictions.)

For avoidance of doubt, the performance criteria and protection based vesting set forth in these terms and conditions continue to apply to a CV Award.

Satisfaction of Conditions:

If your service in a Government Office ends two years or more after your employment with the Firm terminates, or in the case of resignation from the Firm to campaign for a Government Office, your name is on the primary or final public ballot for the election and you are not elected, any CV Awards then outstanding and any such awards that would have then been outstanding but for an accelerated distribution of shares (as described in the subsection captioned “--Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”) will be subject for the remainder of the applicable vesting period to the same terms and conditions of this Award Agreement, including employment restrictions during the vesting period, as if you had resigned from the Firm having met the requirements for Full Career Eligibility.

Failure to Satisfy Conditions:

If you do not satisfy the above “Conditions for Continued Vesting of Awards”, any outstanding PSUs under the CV Award will be cancelled. You also will be required to repay the Fair Market Value of the number of shares (before tax and other withholdings) of Common Stock distributed to you that would have been outstanding as PSUs on the date you failed to satisfy the “Conditions for Continued Vesting of Award” but for their accelerated distribution (as described in subsection captioned, “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”). Fair Market Value for this purpose will be determined as the date that the shares were distributed.

Exhibit 10.23

PERFORMANCE-BASED INCENTIVE COMPENSATION PLAN
Effective as of January 1, 2021 (as amended)

Final Document

JPMorgan Chase & Co.

PERFORMANCE-BASED INCENTIVE COMPENSATION PLAN Effective as of January 1, 2021 (as amended)

SECTION 1 PREAMBLE

The purpose of the Performance-Based Incentive Compensation Plan (“Plan”) is to provide a program that aligns annual performance-based incentive compensation awards to the performance of Eligible Employees during such period, taking into account the performance of JPMorgan Chase & Co., the Participating Company, the Business Unit employing the Eligible Employee and the Eligible Employee. The Plan is designed to attract, motivate and retain those individuals employed by JPMorgan Chase & Co. and its Subsidiaries with an opportunity to receive performance-based incentive compensation as well as reinforce personal accountability. Long-term incentive awards are valuable to align the long-term interests of employees with those of our shareholders by emphasizing sustained value and reinforcing personal accountability, as well as supporting the long-term safety and soundness of the Company with provisions allowing for cancellation or claw-back of awards when warranted.

Nothing in this Plan shall be construed to alter the at-will employment relationship between the Employees and any Participating Company. The provisions of this Plan reflect the policies of the Participating Companies in providing performance-based incentive compensation years prior to the Effective Date.

Further, this Plan is intended to be a performance-based compensation plan within the meaning of Section 409A of the Internal Revenue Code and Treasury regulations promulgated thereunder. By way of further clarification, Section 4.3 of the Plan is intended to satisfy the final Treasury regulations dealing with subjective performance criteria.

SECTION 2 DEFINITIONS

The following terms shall have the meaning set forth below, unless a different meaning is plainly required by the context.

- (a) “Award” shall mean an amount of performance-based incentive compensation determined under the Plan, which may be paid in the form of cash, restricted stock units, options, stock appreciation rights or such other form of compensation as JPMorgan Chase may specify.
- (b) “Award Agreement” shall mean a document provided to a recipient of an Award that evidences the grant of a Stock-Based Award or another form of compensation awarded under the Plan and specifies the terms and conditions of such award.
- (c) “Business Unit” shall mean a division, department or a function of a Participating Company.
- (d) “Effective Date” shall mean January 1, 2021. This Plan shall be effective for 2021 Performance Year and thereafter.
- (e) “Eligible Employee” shall mean an Employee described in Section 4.2.
- (f) “Employee” shall mean any person employed by a Participating Company, whether or not an Eligible Employee. An individual is not an Employee for purposes of this Plan if
 - (i) their compensation is paid solely in the form of a commission or fee under contract,
 - (ii) they are classified by the Participating Company as an independent contractor or agent, (iii) they are classified by the Participating Company as an employee of an independent contractor or agent, or (iv) they are classified by the Participating Company as any status other than that of a common law employee of the Participating Company, regardless of whether such individual (whether or not described in (i), (ii) or (iii) above) is subsequently determined to be a common law employee of a Participating Company as the result of administrative agency or judicial proceeding.
- (g) “JPMorgan Chase” shall mean JPMorgan Chase & Co. or any successor thereto.
- (h) “Participating Companies” or “Company” shall mean JPMorgan Chase, any Subsidiary, and/or Legal Entity which, with the consent of JPMorgan Chase, participates in the Plan.
- (i) “Payment Date” shall have the meaning ascribed to it in Section 5.3(a).
- (j) “Performance Year” shall mean the calendar year unless JPMorgan Chase designates a different period.

- (k) “Plan” shall mean this JPMorgan Chase & Co. Performance-Based Incentive Compensation Plan. Participating Companies and Business Units may refer to the Plan with reference to their internal business names, such as the Investment Bank Incentive Compensation Plan.
- (l) “Stock-Based Awards” shall mean any type of award granted pursuant to the JPMorgan Chase & Co. 2005 Long Term Incentive Plan or successor plan.
- (m) “Subsidiary” shall mean any corporate entity in which JPMorgan Chase owns directly or indirectly eighty percent or more of the outstanding stock.
- (n) “162(m) Plan” shall mean the Key Executive Performance Plan of JPMorgan Chase & Co., a performance-based plan adopted to satisfy the requirements of Section 162(m) of the Code.

SECTION 3 ADMINISTRATION

The Plan shall be administered by JPMorgan Chase which shall have the authority to

- Determine whether a performance-based incentive compensation budget shall be established for any particular Performance Year;
- Select Eligible Employees who may be granted Awards;
- Determine
 - individual performance criteria applicable to an Eligible Employee;
 - whether the individual performance criteria have been satisfied;
- Determine the terms and conditions of Awards and the Award Agreement; including the amount of any Award;
- Interpret the provisions of the Plan and the Award Agreements;
- Establish, amend, and rescind any rules and regulations relating to the Plan; and
- Make all other determinations necessary or advisable for the administration of the Plan.

JPMorgan Chase may also correct any defect, supply any omission, and reconcile any inconsistency in the Plan or in any Award, or between the Plan and any Award Agreement, in the manner and to the extent it shall deem desirable to effectuate the purposes of the Plan.

JPMorgan Chase may delegate its authority and responsibilities under the Plan to any person or persons or committee in its discretion, including Business Units or Participating Companies.

The determinations and actions of JPMorgan Chase or its delegate in the administration of the Plan shall be final, conclusive and binding on all parties.

SECTION 4

PERFORMANCE-BASED COMPENSATION ORGANIZATIONAL AND INDIVIDUAL CRITERIA; PARTICIPATION

4.1 **Organizational Criteria.** The annual performance-based incentive compensation under this Plan is discretionary, subject to the determination of the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase (or any successor committee); incentive compensation at the organizational level is determined based on a holistic review of performance of the Company and Business Unit, and takes into consideration several key criteria including:

- Business Results. Client franchise and financial performance are looked at on both an absolute and relative basis. This review may include, but is not limited to, measures such as: Revenue, Net Income, Shareholder value added, and other factors such as client satisfaction, market share, capital and other relevant factors for a business
- Risk, control, and conduct. Includes material risk, control and conduct issues identified and evaluated through business control processes, Know Your Employee and Code of Conduct processes, and the HR Control Forum
- Progress against the Company’s strategy framework:
 - Operating exceptional client franchises
 - Maintaining fortress balance sheet and principles
 - Adding long-term shareholder value
- Alignment to our operating principles:
 - Exceptional Client Service
 - Operational Excellence
 - Commitment to Integrity, Fairness and Responsibility
 - Great Team and Winning Culture

- Market competition and trends
- Other factors. Major staffing decisions and other qualitative factors, including adherence to business principles

4.2 **Participation in the Plan.** JPMorgan Chase or (if so delegated, the Business Unit or Participating Company) may designate an Employee as eligible for an Award (“Eligible Employee”). Such Eligible Employee may receive an Award; **provided** that

- incentive compensation is established for a Performance Year pursuant to Section 4.1,
- the performance of the Eligible Employee satisfies applicable criteria set forth in Section 4.3 for the Performance Year, as determined by JPMorgan Chase or its delegate.

The amount and the form of any Award shall be determined in the sole and absolute discretion of JPMorgan Chase, including the requirement for the execution by such Eligible Employee of such agreements as JPMorgan Chase shall specify. No individual Awards under this Plan are guaranteed at any time during the Performance Year; provided that in the case of new hire and retention agreements, an Award specified therein may guarantee as to amount but all other terms and conditions of this Plan shall apply.

4.3 **Individual Performance Criteria.** In determining whether an Award shall be made to an Eligible Employee, JPMorgan Chase (or if so delegated, each Business Unit or Participating Company) shall measure the performance of an Eligible Employee based on its assessment of the contributions made to the employing Business Unit during the Performance Year using the subjective performance criteria so determined.

- Profitability - Success in
 - Financial performance as compared to budget, prior year or competitors, including expense controls, net income and other financial measures.
 - Improving the quality of earnings.
 - Achieving expense reduction goals.
 - Maintaining capital and leverage ratios in accordance with targeted levels.
- Investing for Growth - Success in
 - Executing investment plans
 - Achieving real revenue growth by market share gains and performance as compared to competitors.
 - Deepening relations with customers.
 - Leveraging the JPMorgan Chase product platform.
- Executing Major Projects - Success in
 - Reaching mission critical project milestones with respect to, and in completing, major corporate and Business Unit projects.
 - Mitigating operational risks associated with such projects.
 - Ensuring that clients (internal and external) consider the completion of the project as a success.
- Managing People and Developing Talent - Success in
 - Increasing diversity representation.
 - Recruiting, developing, and training top talent.
 - Developing a strong leadership culture.
- Operating with Integrity/Protecting the Franchise - Success in
 - Living up to JPMorgan Chase’s Operating Principles, as well as compliance with the Code of Conduct
 - Maintaining good standing with regulators and sustaining a company wide culture of compliance with law and ethical standards.
 - Avoiding reputational and litigation issues.
 - Maintaining a strong control environment.
 - Managing risk.

•

- Other criteria
 - Generation of revenue from efforts of an Employee, including that derived from management of a team.
 - Performance of complex work assignments without supervision and level of skill shown in such performance.
 - Adherence to the work ethic of the Business Unit.
 - Performance reviews exceeding expectations.
 - Such other subjective performance-based criteria as JPMorgan Chase may deem appropriate for the particular job function, so long as determined within 90 days after the start of the Performance Year.

In evaluating the performance contribution of an Eligible Employee, those criteria that are not applicable to the job function or role of the Employee shall be disregarded and such determination shall be that solely of JPMorgan Chase. The determination of the applicable criteria and whether the Eligible Employee has satisfied such performance-based criteria sufficiently to be entitled to an Award shall also be in the sole discretion of JPMorgan Chase (or if so delegated, the management of the Business Unit or the Participating Company). Such evaluations shall occur as of the end of the Performance Year. By way of further clarification, the determination that any subjective performance criteria have been met shall not be made by the Eligible Employee or a family member of the Eligible Employee as defined in the final regulations promulgated under Section 409A.

SECTION 5 AWARDS

5.1 **Determination of Awards.** As soon as reasonably practical following the end of the applicable Performance Year, and after having determined the contribution of, and

performance made by, an Eligible Employee, JPMorgan Chase (or if so delegated, the Business Unit or Participating Company) shall determine the amount of each individual Award.

5.2 **Payment of Awards.** (a) JPMorgan Chase shall specify a payment/distribution date of the Awards (“Payment Date”) in the calendar year following the end of the Performance Year.

Generally, employees must be actively employed on the Payment Date specified by JPMorgan Chase in order to receive an Award. An individual will generally not receive Awards if they have given notice of termination and/or are no longer employed on the Payment Date.

Accordingly, an Eligible Employee has no interest in an Award until paid.

(b) Each individual Award shall specify the amount or percentage of the performance-based incentive compensation that shall be distributed in the form of cash, Stock- Based Awards or such other form as may be designated by JPMorgan Chase. Notwithstanding the foregoing, if the Award Agreement of a Participant who is not a United States citizen and who works outside of the United States so provides, a Participating Company may deliver property or make contributions to a trust in lieu of providing incentive compensation hereunder.

(c) If JPMorgan Chase so advises and Eligible Employee agrees, the cash portion of any performance-based incentive compensation may be deferred pursuant to the terms of the 2005 Deferred Compensation Program of JPMorgan Chase & Co. and Participating Companies, or any successor plan or any applicable deferral program available to Eligible Employees who are based in locations outside the United States.

(d) The portion of any performance-based incentive compensation payable as a Stock-Based Award shall be granted pursuant to the terms of an approved equity compensation plan or arrangement as determined by JPMorgan Chase in its sole discretion.

(e) It is expressly intended that the Awards whether or not vested or immediately payable are designed to promote continued employment and future services from an Eligible Employee, as well as reward for performance.

(f) All Awards will be reflected in Award Agreements signed by an authorized officer of JPMorgan Chase. No employee or officer of JPMorgan Chase is authorized to make oral promises or representations about Awards under this Plan.

SECTION 6

TAXES AND OTHER WITHHOLDING

Participating Companies shall have the right to (i) deduct from all amounts payable to any recipient of an Award (whether amounts are payable in cash), and each recipient shall make appropriate arrangements to pay the withholding amounts related to any taxes or other amounts required by law to be withheld, and (ii) offset any amounts otherwise payable hereunder by any amount the recipient owes a Participating Company, to the full extent permitted by law.

SECTION 7

NON-TRANSFERABILITY

No rights hereunder or Awards shall be assignable or transferable except as specified, and no right or interest in any Award shall be subject to any lien, obligation or liability of the Eligible Employee.

SECTION 8

NO RIGHT TO EMPLOYMENT CONTINUED PLAN PARTICIPATION

No person shall have any claim or right to be granted an Award, and the grant of an Award shall not be construed as giving the Employee recipient the right to be retained in the employ of a Participating Company. In addition, no Award under the Plan made during or in respect of any Performance Year or other period shall confer on an Employee any right or entitlement to, nor shall any Award impose any obligation on a Participating Company to provide, the same or any similar Award in the future, and all Plan awards are made wholly at the sole and unrestricted discretion of JPMorgan Chase. Further, each Participating Company expressly reserves the right at any time to terminate an Employee or Eligible Employee employed by it or free from any liability or any claim under the Plan, except as provided herein or in any Award granted hereunder.

SECTION 9

AMENDMENT AND TERMINATION

JPMorgan Chase may amend or terminate the Plan or any portion hereof at any time and in any manner, provided that the subjective individual performance criteria set forth in Section 4.3 can only be amended prior to the expiration of the Performance Year to which such criteria pertain.

SECTION 10 STATUS OF PLAN

The Plan is intended to constitute an “unfunded” incentive compensation plan. With respect to any payments not yet made to a recipient of an Award by a Participating Company, nothing herein contained shall provide any such individual with any rights that are greater than those of a general, unsecured creditor of the Participating Company. No such individual shall at any time possess any interest whatsoever in the assets of the Participating Company. No payments under this Plan shall be taken into account as salary or other relevant compensation in determining an Employee’s benefits under any compensation, pension or welfare plan (unless the plan specifically permits the inclusion of such Award), program or arrangement maintained by the Participating Company. In addition, the terms of this document and any particular Award document granted to an Employee shall exclusively embody the complete terms of the Plan as applied to such an individual and shall supersede any other documents or representations that in any way relate to any Award.

SECTION 11

WAIVER

No failure on the part of the Participating Company to exercise, and to delay in exercising, any right or power under the Plan shall operate as a waiver of any such right or power; nor shall any single or partial exercise preclude any other or further exercise of a right or power or the exercise of any other right or power.

**SECTION 12
SEVERABILITY**

Each provision of the Plan will be interpreted in such manner as to be valid and effective but if any provision shall be ruled invalid or unenforceable in any jurisdiction by any court of competent jurisdiction, the invalidity or unenforceability of such provision in such jurisdiction shall not affect any of the remaining provisions of the Plan and the invalid term shall be deemed to be replaced in such jurisdiction by a valid term which most closely reflects the intent of the Plan.

**SECTION 13
ASSIGNMENT**

If JPMorgan Chase shall be merged into or consolidated with another entity, this Plan shall be binding upon the entity surviving such merger or resulting from such consolidation. JPMorgan Chase shall require any successor to all or substantially all of JPMorgan Chase's equity or assets (whether by direct or indirect purchase, merger, consolidation or otherwise) to, either expressly or by operation of law, assume and agree to perform under this Plan as if no such succession had taken place, and all references to the "JPMorgan Chase" herein shall become references to such successor.

**SECTION 14 GOVERNING
LAW**

The validity, construction and effect of the Awards, the Plan and any rules and regulations relating to the Plan shall be determined in accordance with the laws of the State of New York, without regard to conflicts of laws principles.

**SECTION 15 EFFECTIVE
DATE**

The Plan shall be effective as of the Effective Date and shall continue until terminated by the JPMorgan Chase.

Exhibit 21

JPMorgan Chase & Co.

List of subsidiaries

While there are a number of subsidiaries that are required to be reported for various purposes to bank regulators, the following is a list of JPMorgan Chase & Co.'s significant legal entity subsidiaries as of December 31, 2021, as defined by SEC rules. The list includes the parent company of significant subsidiaries even if the parent company did not meet the definition of a significant subsidiary. Excluded from the list are subsidiaries that, if considered in the aggregate, would not constitute a significant subsidiary under SEC rules as of December 31, 2021.

Also included in the list are certain subsidiaries that have been designated as material legal entities for resolution planning purposes under the Dodd-Frank Act that did not meet the definition of a significant subsidiary under SEC rules.

December 31, 2021 Name	Organized Under The Laws Of
JPMorgan Chase Bank, National Association	United States
Paymentech, LLC	United States
J.P. Morgan International Finance Limited	United States
J.P. Morgan Bank Luxembourg S.A.	Luxembourg
JPMorgan Securities Japan Co., Ltd.	Japan
J.P. Morgan Capital Holdings Limited	United Kingdom
J.P. Morgan Securities PLC	United Kingdom
J.P. Morgan AG	Germany
JPMorgan Chase Holdings LLC	United States
J.P. Morgan Services India Private Limited	India
JPMorgan Asset Management Holdings Inc.	United States
JPMorgan Distribution Services, Inc.	United States
JPMorgan Asset Management International Limited	United Kingdom
JPMorgan Asset Management (UK) Limited	United Kingdom
JPMorgan Asset Management Holdings (Luxembourg) S.à r.l.	Luxembourg
JPMorgan Asset Management (Europe) S.à r.l.	Luxembourg
J.P. Morgan Investment Management Inc.	United States
J.P. Morgan Broker-Dealer Holdings Inc.	United States
J.P. Morgan Securities LLC	United States

Exhibit 22.2
JPMorgan Chase & Co.

JPMorgan Chase & Co. guarantee of subsidiary issuances

Securities	Guarantor
JPMorgan Chase Financial Company LLC issues, from time to time, its Global Medium-Term Notes, Series A, under the Indenture dated February 19, 2016 that are each fully and unconditionally guaranteed by JPMorgan Chase & Co. and are currently offered and sold pursuant to a Registration Statement on Form S-3 (Registration Statement Nos. 333-236659 and 333-236659-01), which was declared effective on April 8, 2020.	JPMorgan Chase & Co.

Exhibit 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on:

Form S-3

(No. 333-236659)

(No. 333-236659-01)

(No. 333-230098)

Form S-8

(No. 333-219702)

(No. 333-219701)

(No. 333-219699)

(No. 333-185584)

(No. 333-185582)

(No. 333-185581)

(No. 333-175681)

(No. 333-158325)

(No. 333-142109)

(No. 333-125827)

(No. 333-112967)

of JPMorgan Chase & Co. or its affiliates of our report dated February 22, 2022 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

New York, New York

February 22, 2022

Exhibit 31.1
JPMorgan Chase & Co.

CERTIFICATION

I, James Dimon, certify that:

1. I have reviewed this Annual Report on Form 10-K of JPMorgan Chase & Co.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 22, 2022

/s/ James Dimon

James Dimon
Chairman and Chief Executive Officer

Exhibit 31.2
JPMorgan Chase & Co.

CERTIFICATION

I, Jeremy Barnum, certify that:

1. I have reviewed this Annual Report on Form 10-K of JPMorgan Chase & Co.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 22, 2022

/s/ Jeremy Barnum

Jeremy Barnum
Executive Vice President and Chief Financial Officer

Exhibit 32
JPMorgan Chase & Co.

**CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of JPMorgan Chase & Co. on Form 10-K for the period ended December 31, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned officers of JPMorgan Chase & Co., certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of JPMorgan Chase & Co.

Date: February 22, 2022

By: /s/ James Dimon

James Dimon
Chairman and Chief Executive Officer

Date: February 22, 2022

By: /s/ Jeremy Barnum

Jeremy Barnum
Executive Vice President and Chief Financial Officer

This certification accompanies this Annual Report and shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, or otherwise subject to the liability of that Section.

A signed original of this written statement required by Section 906 has been provided to, and will be retained by, JPMorgan Chase & Co. and furnished to the Securities and Exchange Commission or its staff upon request.