

J.P. Morgan Securities LLC and Subsidiaries

(an indirect wholly-owned subsidiary of JPMorgan Chase & Co.)

Consolidated Statement of Financial Condition and Supplemental Schedules December 31, 2019

Table of Contents
December 31, 2019

	Page
Report of Independent Registered Public Accounting Firm	1
Consolidated Statement of Financial Condition	2
Notes to Consolidated Statement of Financial Condition	
Note 1. Organization	3
Note 2. Significant accounting policies	4
Note 3. Fair value measurement of financial instruments	8
Note 4. Fair value option	17
Note 5. Customer activities	18
Note 6. Derivative instruments	19
Note 7. Employee benefits and compensation	24
Note 8. Securities financing activities	25
Note 9. Variable interest entities	27
Note 10. Short-term borrowings	29
Note 11. Long-term debt	29
Note 12. Subordinated borrowings	30
Note 13. Related parties	30
Note 14. Income taxes	30
Note 15. Regulatory requirements	31
Note 16. Commitments, guarantees, pledged assets, collateral and contingencies	32
Note 17. Subsequent events	35
Supplemental Schedules	
Computation of Segregation Requirements and Funds in Segregation for Customers Trading on U.S. Commodity Exchanges pursuant to Section 4d(a)(2) of the Commodity Exchange Act	36
Computation of Secured Amounts and Funds Held in Separate Accounts for Foreign Futures and Foreign Options Customers pursuant to Commission Regulation 30.7	37
Computation of Cleared Swaps Customer Segregation Requirements and Funds in Cleared Swaps Customer Accounts under 4d(f) of the Commodity Exchange Act	38



Report of Independent Registered Public Accounting Firm

To the Board of Managers and Member of J.P. Morgan Securities LLC and Subsidiaries

Opinion on the Financial Statement - Consolidated Statement of Financial Condition

We have audited the accompanying consolidated statement of financial condition of J.P. Morgan Securities LLC and its subsidiaries (the "Company") as of December 31, 2019, including the related notes (collectively referred to as the "consolidated financial statement"). In our opinion, the consolidated financial statement presents fairly, in all material respects, the financial position of the Company as of December 31, 2019 in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

The consolidated financial statement is the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statement based on our audit. 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 Company 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 audit of this consolidated financial statement in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statement is free of material misstatement, whether due to error or fraud.

Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statement, 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 statement. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statement. We believe that our audit provides a reasonable basis for our opinion.

Supplemental Information

The Computation of Segregation Requirements and Funds in Segregation for Customers Trading on U.S. Commodity Exchanges pursuant to Section 4d(a)(2) of the Commodity Exchange Act, Computation of Secured Amounts and Funds Held in Separate Accounts for Foreign Futures and Foreign Options Customers pursuant to Commission Regulation 30.7 and Computation of Cleared Swaps Customer Segregation Requirements and Funds in Cleared Swaps Customer Accounts under 4d(f) of the Commodity Exchange Act have been subjected to audit procedures performed in conjunction with the audit of the Company's financial statement. The supplemental information is the responsibility of the Company's management. Our audit procedures included determining whether the supplemental information reconciles to the consolidated financial statement or the underlying accounting and other records, as applicable, and performing procedures to test the completeness and accuracy of the information presented in the supplemental information. In forming our opinion on the supplemental information, we evaluated whether the supplemental information, including its form and content, is presented in conformity with Regulation 1.10 under the Commodity Exchange Act. In our opinion, the Computation of Segregation Requirements and Funds in Segregation for Customers Trading on U.S. Commodity Exchanges pursuant to Section 4d(a)(2) of the Commodity Exchange Act, Computation of Secured Amounts and Funds Held in Separate Accounts for Foreign Futures and Foreign Options Customers pursuant to Commission Regulation 30.7 and Computation of Cleared Swaps Customer Segregation Requirements and Funds in Cleared Swaps Customer Accounts under 4d(f) of the Commodity Exchange Act are fairly stated, in all material respects, in relation to the consolidated financial statement as a whole.

A handwritten signature in black ink that reads "PricewaterhouseCoopers LLP". The signature is written in a cursive, flowing style.

March 2, 2020

We have served as the Company's auditor since 2008.

Consolidated Statement of Financial Condition
December 31, 2019

(in millions)

Assets	
Cash	\$ 9,594
Securities purchased under resale agreements (included \$14,133 at fair value)	176,418
Securities borrowed	107,494
Securities received as collateral, at fair value (included assets pledged of \$1,975)	3,194
Receivables from customers	31,474
Receivables from brokers, dealers, clearing organizations and others	14,650
Financial instruments owned, at fair value (included assets pledged of \$67,776)	144,633
Goodwill	1,356
Other assets (included \$6 at fair value)	2,132
Total assets^(a)	\$ 490,945
Liabilities	
Short-term borrowings (included \$2,905 at fair value)	\$ 44,459
Securities sold under repurchase agreements (included \$246 at fair value)	244,497
Securities loaned	5,357
Obligation to return securities received as collateral, at fair value	3,550
Payables to customers	93,581
Payables to brokers, dealers, clearing organizations and others	10,187
Financial instruments sold, not yet purchased, at fair value	35,037
Other liabilities and accrued expenses	2,961
Beneficial interests issued by consolidated variable interest entities ("VIEs"), at fair value	35
Long-term debt, at fair value	15,498
Total liabilities^(a)	455,162
Commitments and contingencies (refer to Note 16)	
Subordinated borrowings	24,000
Member's equity	
Member's interest	6,167
Retained earnings	5,616
Total member's equity	11,783
Total liabilities and member's equity	\$ 490,945

(a) The following table presents information on assets and liabilities related to VIEs that are consolidated by the Company at December 31, 2019. 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 the Company. The assets and liabilities in the table below include third party-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation. Refer to Note 9 for further information.

(in millions)

Assets	
Financial instruments owned	\$ 448
Total assets	\$ 448
Liabilities	
Beneficial interests issued by consolidated VIEs	\$ 35
Total liabilities	\$ 35

The accompanying Notes are an integral part of the Consolidated Statement of Financial Condition.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

1. Organization

The Consolidated Statement of Financial Condition includes the accounts of J.P. Morgan Securities LLC (“J.P. Morgan Securities”) and its subsidiaries (collectively the “Company”). The Company is an indirect wholly-owned subsidiary of JPMorgan Chase & Co. (“JPMorgan Chase”), which is a leading global financial services firm and one of the largest banking institutions in the United States of America (“U.S.”), with operations worldwide. JPMorgan Chase Holdings LLC (the “IHC”) is an intermediate holding company of JPMorgan Chase and indirectly holds the member’s interest of the Company. For purposes of this report, an “affiliate” is defined as JPMorgan Chase or a direct or indirect subsidiary of JPMorgan Chase. The Company is a registered broker-dealer and investment adviser with the U.S. Securities and Exchange Commission (“SEC”) and a futures commission merchant (“FCM”) with the Commodities Futures Trading Commission (“CFTC”). The Company is provisionally registered with the National Futures Association (“NFA”) as a swap dealer, and it is progressing toward final registration. The Company is also a member of the Securities Investor Protection Corporation (“SIPC”), the New York Stock Exchange (“NYSE”) and other exchanges.

The Company’s Board of Managers is responsible for the oversight of management of the Company, and it accomplishes this function acting directly and through the principal standing committees of JPMorgan Chase’s Board of Directors and the Company’s own committees and forums.

JPMorgan Chase’s Board of Directors’ 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 reputation risk and conduct risk issues within its scope of responsibility.

The Company relies on each of JPMorgan Chase’s lines of business and Corporate areas giving rise to risk to operate within the parameters identified by JPMorgan Chase’s Independent Risk Management function (consisting of the Risk Management and Compliance organizations), and within its own management-identified risk and control standards.

Nature of business

The Company acts as a primary dealer in U.S. government securities; makes markets in money market instruments and U.S. government agency securities; underwrites and trades various types of debt and equity securities (including securities issued by JPMorgan Chase or its affiliates); advises clients on business strategies, capital structures and financial strategies; structures derivative transactions to meet client needs; engages in the execution and clearance of exchange-traded futures and options; clears over-the-counter (“OTC”) derivative contracts in connection with JPMorgan Chase’s and its affiliates’ client-driven market-making and risk management activities; and offers brokerage and investment advisory products and services to a range of retail investors. The Company provides securities clearing and customer financing, and engages in secured financing transactions to finance its securities activities, including through J.P. Morgan Securities’ wholly-owned subsidiary J.P. Morgan Prime Inc. (“J.P. Morgan Prime”) for certain prime brokerage customer transactions. Additionally, the Company acts as a clearing broker carrying and clearing (i) customer cash and margin accounts for correspondents and certain activities of its affiliates on either a fully disclosed or omnibus basis, and (ii) proprietary trading accounts of hedge funds, brokers and dealers and other professional trading firms (collectively “clearing clients”).

Credit ratings

The credit ratings of the Company as of December 31, 2019, were as follows.

	Moody’s Investors Service (“Moody’s”)	Standard & Poor’s (“S&P”)	Fitch
Outlook	Stable	Stable	Stable
Long-term issuer rating	Aa3	A+	AA
Short-term issuer rating	P-1	A-1	F1+

Notes to Consolidated Statement of Financial Condition December 31, 2019

2. Significant accounting policies

The accounting and financial reporting policies of the Company and its subsidiaries conform to accounting principles generally accepted in the U.S. ("U.S. GAAP"). Additionally, where applicable, the policies conform to the accounting and reporting guidelines prescribed by regulatory authorities.

(a) Accounting and reporting developments

Financial Accounting Standards Board ("FASB") Standards adopted during 2019

Standard	Summary of guidance	Effects on Consolidated Statement of Financial Condition
Leases <i>Issued February 2016</i>	<ul style="list-style-type: none"> Requires lessees to recognize all leases longer than twelve months on the Consolidated Statement of Financial Condition as a lease liability with a corresponding right-of-use asset. Requires lessees and lessors to classify most leases using principles similar to existing lease accounting, but eliminates the "bright line" classification tests. Expands qualitative and quantitative leasing disclosures. 	<ul style="list-style-type: none"> Adopted January 1, 2019. The Company elected the available practical expedient to not reassess whether existing contracts contain a lease or whether classification or unamortized initial lease costs would be different under the new lease guidance. The adoption of the new lease guidance did not have a material impact on the Company's Consolidated Statement of Financial Condition or a material change to the future net minimum rental payments.

FASB Standards issued but not yet adopted as of December 31, 2019

Standard	Summary of guidance	Effects on Consolidated Statement of Financial Condition
Financial instruments - credit losses <i>Issued June 2016</i>	<ul style="list-style-type: none"> Establishes a single allowance framework for all financial assets carried at amortized cost and certain off-balance sheet exposures. This framework requires that management's estimate reflects credit losses over the full remaining expected life and considers expected future changes in macroeconomic conditions. Requires a cumulative-effect adjustment to retained earnings as of the beginning of the reporting period of adoption. 	<ul style="list-style-type: none"> Adopted January 1, 2020. As permitted by the guidance, the Company elected the fair value option for certain securities financing agreements. The difference between their carrying amount and fair value was immaterial and was recorded as part of the Company's cumulative-effect adjustment.
Goodwill <i>Issued January 2017</i>	<ul style="list-style-type: none"> Requires recognition of an impairment loss when the estimated fair value of a reporting unit falls below its carrying value. Eliminates the requirement that an impairment loss be recognized only if the estimated implied fair value of the goodwill is below its carrying value. 	<ul style="list-style-type: none"> Adopted January 1, 2020. No impact upon adoption as the guidance is to be applied prospectively.
Income Tax Simplifications <i>Issued December 2019</i>	<ul style="list-style-type: none"> Provides targeted amendments to simplify the accounting for income taxes. Clarifies that the consolidated amount of current and deferred tax expense is not required to be allocated to subsidiaries that, on their own, are not subject to tax ("disregarded entities"). Provides an election to do so on an entity-by-entity basis. The guidance related to allocation of tax amounts to disregarded entities must be applied on a retrospective basis for all periods presented. Other amendments must be applied on a modified retrospective basis or a prospective basis. 	<ul style="list-style-type: none"> Required effective date: January 1, 2021.^(a) The Company is currently evaluating the timing of adoption and the potential impact on the Consolidated Statement of Financial Condition.

(a) Early adoption is permitted.

(b) Basis of presentation Consolidation

The Consolidated Statement of Financial Condition includes the accounts of the Company and entities in which the Company has a controlling financial interest as of December 31, 2019. All material intercompany balances and transactions have been eliminated. The Company 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 ("VIE").

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 Company's determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which the Company has a

Notes to Consolidated Statement of Financial Condition

December 31, 2019

controlling financial interest, through ownership of the majority of the entities' voting equity interests, or through other contractual rights that give the Company control, are consolidated by the Company. Investments in companies in which the Company 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 Company to recognize its proportionate share of the entity's net earnings), or (ii) at fair value if the fair value option was elected.

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 a special purpose entity ("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 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 Company has the power to direct the activities of a VIE that most significantly impact the VIE's economic performance, the Company considers all 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, 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 Company has the obligation to absorb losses or the right to receive benefits that could potentially be significant to the VIE, the Company considers all of its economic interests, including debt and equity investments, derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that the Company 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 within the VIE's capital structure; and the reasons why the interests are held by the Company.

The Company performs ongoing reassessments of (1) whether any 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 Company's involvement with a VIE cause the Company's consolidation conclusion to change. Refer to Note 9 for further information related to VIEs.

Assets held for clients in an agency or fiduciary capacity

Assets owned by customers, including those that collateralize margin or other similar transactions and are held for clients in an agency or fiduciary capacity by the Company, are not assets of the Company and are not included on the Consolidated Statement of Financial Condition.

Use of estimates in the preparation of the Consolidated Statement of Financial Condition

The preparation of the Consolidated Statement of Financial Condition requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities. Actual results could be different from these estimates.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

Foreign currency translation

The Company revalues assets and liabilities denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

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 Statement of Financial Condition when a legally enforceable master netting agreement exists. U.S. GAAP also permits resale and repurchase agreements, securities borrowed and loaned agreements, and transactions that arise when the Company fails to deliver or receive securities, to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. The Company has elected to net such balances when the specified conditions are met.

The Company uses master netting agreements to mitigate counterparty credit risk in certain transactions, including derivatives transactions, resale and repurchase agreements, and securities borrowed and 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 termination rights by the non-defaulting party (i) all transactions are terminated, (ii) all transactions are valued and the positive value or “in the money” transactions are netted against the negative value or “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 repurchase agreement and securities loaned default rights 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 Notes 6 and 8, respectively, for further information on the Company’s derivative instruments and securities financing activities.

(c) Cash

Cash represents funds deposited with financial institutions, including cash segregated to satisfy rules regarding the protection of assets of customers as required by the SEC and the CFTC, the Company’s primary regulators. Refer to Note 15 for further information.

(d) Securities financing agreements

Resale and repurchase agreements, and securities borrowed and loaned agreements (collectively, “securities financing agreements”), are treated as collateralized transactions and are recorded at the amount of cash collateral advanced or received. Additionally, the Company may receive securities as collateral in securities-for-securities transactions. If the Company is the lender in these transactions and where the Company is permitted to sell or repledge the collateral received, the Company reports the fair value of the securities received as collateral and the related obligation to return securities received as collateral on the Consolidated Statement of Financial Condition. Refer to Note 8 for further information.

(e) Customer transactions

Receivables from and payables to customers primarily include amounts arising from securities and margin transactions. These customer securities transactions are recorded on the Consolidated Statement of Financial Condition on a settlement date basis. In the event of fails to deliver or receive securities, the Company records corresponding receivables from customers or payables to customers, respectively. The Company does not reflect the clients’ underlying securities or derivative contracts on its Consolidated Statement of Financial Condition.

The Company monitors the market value of collateral held to secure receivables from customers. It is the Company’s policy to request and obtain additional collateral when appropriate.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

(f) Brokers, dealers, clearing organizations and others

Receivables from brokers, dealers, clearing organizations and others include margin deposits, as well as receivables when the Company fails to deliver securities to a purchaser by the settlement date. Payables to brokers, dealers, clearing organizations and others include payables when the Company fails to receive securities from a seller by the settlement date. Brokers, dealers, clearing organizations and other receivables and payables additionally include the variation margin related to futures contracts cleared on domestic and international derivative exchanges, accrued interest receivables and payables, as well as net receivables or net payables arising from unsettled trades.

(g) Financial instruments

Financial instruments owned and financial instruments sold, not yet purchased are accounted for at fair value. These securities transactions in regular way trades are recorded on the trade date, the date on which an agreement is executed to purchase or sell a security. Principal securities transactions in non-regular way trades are recorded on the settlement date (the date on which the payment of funds and delivery of securities are to take place) with changes in value recorded on the Consolidated Statement of Financial Condition between trade and settlement dates. Refer to Note 3 for further information related to the Company's valuation methodologies under fair value measurement.

Balances reflect the reduction of financial instruments owned (long positions) by the amount of identical financial instruments sold, not yet purchased (short positions) when the long and short positions have identical Committee on Uniform Security Identification Procedures numbers ("CUSIPs").

(h) 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. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment annually, or more often if events or circumstances, such as adverse changes in the business climate, indicate that there may be impairment.

Impairment testing

The Company's goodwill was not impaired at December 31, 2019, nor was any goodwill written off due to impairment during the year ended December 31, 2019.

The goodwill impairment test is performed in two steps. In the first step, the current fair value of the Company is compared with its carrying value. If the fair value is in excess of the carrying value, the Company's goodwill is considered not to be impaired. If the fair value is less than the carrying value, then a second step is performed. In the second step, the implied current fair value of the Company's goodwill is determined by comparing the fair value of the Company (as determined in step one) to the fair value of the net assets of the Company, as if the Company were being acquired in a business combination. The resulting implied current fair value of goodwill is then compared with the carrying value of the Company's goodwill. If the carrying value of the goodwill exceeds its implied current fair value, then an impairment charge is recognized for the excess. If the carrying value of goodwill is less than its implied current fair value, then no goodwill impairment is recognized.

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 value of the Company or its associated goodwill 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.

(i) Other assets, and other liabilities and accrued expenses

Other assets can consist of deferred or current income tax assets, syndicate receivables, dividend receivables, cash collateral receivables resulting from derivative transactions, prepaid expenses and other. Other liabilities and accrued expenses can consist of deferred or current income tax liabilities, syndicate payables, dividend payables, cash collateral payables resulting from derivative transactions, accrued compensation and benefits, reserves and other.

(j) Income taxes

The results of operations of the Company are included in the consolidated federal, New York State, New York City and other state income tax returns filed by JPMorgan Chase. Pursuant to a tax sharing agreement, JPMorgan Chase allocates to the Company its share of the consolidated income tax expense or benefit based upon statutory rates applied to the Company's earnings as if it were filing a separate income tax return. Furthermore, JPMorgan Chase will reimburse the Company currently for losses irrespective of whether the Company would utilize losses on a separate return basis. The Company uses the separate return adjusted for benefits-for-loss allocation methodology to provide for income taxes on all transactions recorded on the Consolidated Statement of Financial Condition. Valuation allowances are established when necessary to reduce deferred tax assets to an amount that in

Notes to Consolidated Statement of Financial Condition

December 31, 2019

the opinion of management, is more likely than not to be realized. State and local income taxes are provided on the Company's taxable income at the effective income tax rate applicable to the consolidated JPMorgan Chase entity.

The guidance on accounting for uncertainty in income taxes describes how uncertain tax positions should be recognized, measured, presented and disclosed on the Consolidated Statement of Financial Condition. This guidance requires the evaluation of tax positions taken or expected to be taken in the course of preparing the Company's Consolidated Statement of Financial Condition to determine whether the tax positions are more likely than not to be realized as a tax benefit or expense in the current year. After-tax interest and penalties, as well as the related unrecognized tax benefits, are recognized in income tax expense.

The tax sharing agreement between JPMorgan Chase and the Company allows for intercompany payments to or from JPMorgan Chase for outstanding current tax assets or liabilities.

Refer to Note 14 for further information.

3. Fair value measurement of financial instruments

The Company carries a portion of its assets and liabilities at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on the Company's Consolidated Statement of Financial Condition).

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 but not limited to yield curves, interest rates, volatilities, prices (such as equity or debt prices), correlations, foreign exchange ("FX") 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 Company 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 Company's businesses and portfolios.

The Company 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 Company could result in the Company 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 Statement of Financial Condition at fair value. JPMorgan Chase's Valuation Control Group ("VCG"), which is part of JPMorgan Chase'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 Company's positions are recorded at fair value. In addition, JPMorgan Chase's 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 JPMorgan Chase. The VGF is chaired by the JPMorgan Chase Firmwide head of the VCG (under the direction of JPMorgan Chase's Controller), and includes sub-forums covering the Company.

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 estimates. The additional review may include: evaluating the limited market activity including client unwinds; benchmarking of valuation inputs to those 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 are applied for instruments classified within level 1 of the fair value hierarchy (see below for further information on the fair value hierarchy). For other positions, judgment is required to assess the need for valuation adjustments to appropriately

Notes to Consolidated Statement of Financial Condition

December 31, 2019

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 JPMorgan Chase.

Valuation adjustments

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 Company 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 observable parameters may be made when positions are valued 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 Company also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality, JPMorgan Chase's own creditworthiness and the impact of funding, applying a consistent framework across the Company.

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 JPMorgan Chase's Estimations and Model Risk Management Policy, the Model Risk function 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 JPMorgan Chase's policy to allow a model to be used prior to review or approval. JPMorgan Chase's Model Risk function 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.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

Valuation hierarchy

A three-level valuation hierarchy has been established under U.S. GAAP for disclosure of fair value measurements. The valuation 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 valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The following is a description of the valuation methodologies generally used by the Company to measure its more significant products/instruments at fair value, including the general classification of such instruments pursuant to the valuation hierarchy.

Product/instrument	Valuation methodology	Classifications in the valuation hierarchy
Securities financing agreements	<p>Valuations are based on discounted cash flows, which consider:</p> <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 	Level 2
Debt and equity instruments	<p>Quoted market prices.</p> <p>In the absence of quoted market prices, financial instruments are valued based on:</p> <ul style="list-style-type: none"> • Observable market prices for similar securities (excludes loans) • Observable market prices for loans (circumstances are infrequent) • Relevant broker quotes • Discounted cash flows <p>In addition, the following inputs to discounted cash flows are used for the following products:</p> <p>Mortgage- and asset-backed securities specific inputs:</p> <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 <p>Collateralized loan obligations ("CLOs") specific inputs:</p> <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 <p>Other (predominantly includes structured notes issued by affiliates of the Company):</p> <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 financial instrument • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that 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 below regarding derivative valuation 	<p>Level 1</p> <p>Level 2 or 3</p>

Notes to Consolidated Statement of Financial Condition
December 31, 2019

Product/instrument	Valuation methodology	Classifications in the valuation 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 may use observable or unobservable valuation inputs as well as taking into account 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, interest rate yield curves, foreign exchange rates, volatilities, correlations, credit default swap (“CDS”) spreads and recovery rates. Additionally, the credit quality of the counterparty and of the Company as well as market funding levels may be considered.</p> <p>In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows:</p> <p>Structured credit derivatives specific inputs include:</p> <ul style="list-style-type: none"> • CDS spreads and recovery rates • Credit correlation between the underlying debt instruments <p>Equity option specific inputs include:</p> <ul style="list-style-type: none"> • Forward equity price • Equity volatility • Equity correlation • Equity-foreign exchange (“equity-FX”) correlation • Equity-interest rate (“equity-IR”) correlation <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 • Foreign exchange correlation • Interest rate-foreign exchange (“IR-FX”) correlation 	Level 2 or 3
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
Structured notes (included in short-term borrowings and long-term debt)	<p>Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note.</p> <p>The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that 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 derivative valuation.</p>	Level 2 or 3

Notes to Consolidated Statement of Financial Condition

December 31, 2019

The following table presents the assets and liabilities measured at fair value as of December 31, 2019, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

(in millions)	Fair value hierarchy			Derivative netting adjustments	Total fair value
	Level 1	Level 2	Level 3		
Securities purchased under resale agreements	\$ —	\$ 14,133	\$ —	\$ —	\$ 14,133
Securities received as collateral ^(a)	2,674	497	23	—	3,194
Financial instruments owned:					
Mortgage-backed securities:					
U.S. Government-sponsored enterprises (“GSEs”) and government agencies ^(b)	1	39,580	89	—	39,670
Residential - nonagency	—	1,006	9	—	1,015
Commercial - nonagency	—	1,282	3	—	1,285
Total mortgage-backed securities	1	41,868	101	—	41,970
U.S. Treasury, GSEs and government agencies ^{(b)(c)}	61,787	9,213	—	—	71,000
Obligations of U.S. states and municipalities	1	1,494	5	—	1,500
Certificates of deposit, bankers’ acceptances and commercial paper	—	71	11	—	82
Corporate debt securities	—	6,285	5	—	6,290
Equity securities	18,512	168	99	—	18,779
Asset-backed securities	—	2,206	26	—	2,232
Loans	—	66	—	—	66
Other	—	1,664	493	—	2,157
Total debt and equity instruments^(d)	80,301	63,035	740	—	144,076
Derivative receivables:					
Interest rate	368	3,152	12	(3,393)	139
Credit	—	364	1	(318)	47
Foreign exchange	—	202	76	(233)	45
Equity ^(e)	—	26,171	2,367	(28,212)	326
Total derivative receivables^(f)	368	29,889	2,456	(32,156)	557
Total financial instruments owned	80,669	92,924	3,196	(32,156)	144,633
Other assets	—	—	6	—	6
Total assets measured at fair value on a recurring basis	\$ 83,343	\$ 107,554	\$ 3,225	\$ (32,156)	\$ 161,966
Short-term borrowings	\$ —	\$ 2,740	\$ 165	\$ —	\$ 2,905
Securities sold under repurchase agreements	—	246	—	—	246
Obligation to return securities received as collateral ^(a)	3,030	497	23	—	3,550
Financial instruments sold, not yet purchased:					
Debt and equity instruments ^(d)	28,789	4,182	2	—	32,973
Derivative payables:					
Interest rate	390	2,890	—	(3,154)	126
Credit	—	389	2	(335)	56
Foreign exchange	—	453	—	(418)	35
Equity ^(e)	—	29,098	4,180	(31,431)	1,847
Total derivative payables^(f)	390	32,830	4,182	(35,338)	2,064
Total financial instruments sold, not yet purchased	29,179	37,012	4,184	(35,338)	35,037
Beneficial interests issued by consolidated VIEs	—	35	—	—	35
Long-term debt	—	8,113	7,385	—	15,498
Total liabilities measured at fair value on a recurring basis	\$ 32,209	\$ 48,643	\$ 11,757	\$ (35,338)	\$ 57,271

(a) Represents securities-for-securities lending transactions when the Company is acting as the lender.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

- (b) Includes total U.S. GSE obligations of \$21.5 billion, which were predominantly mortgage-related. U.S. GSEs are quasi-governmental, privately held entities established by 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 Federal National Mortgage Association ("Fannie Mae") and Federal Home Loan Mortgage Corporation ("Freddie Mac"), but do not include Government National Mortgage Association ("Ginnie Mae"), which is directly owned by the U.S. Department of Housing and Urban Development. 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.
- (c) Includes securities that were segregated to satisfy SEC and CFTC rules regarding the protection of assets of customers. Refer to Note 15 for further information.
- (d) Balances reflect the reduction of financial instruments owned (long positions) by the amount of identical financial instruments sold, not yet purchased (short positions).
- (e) Equity derivative receivables and payables in level 3 primarily relate to positions with affiliates.
- (f) As permitted under U.S. GAAP, the Company 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. For purposes of the table above, the Company does not reduce derivative receivables and derivative payables balances for this netting adjustment, either within or across the levels of the fair value hierarchy, as such netting is not relevant to a presentation based on the transparency of inputs to the valuation of an asset or liability. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral. Refer to Note 6 for further information.

Level 3 valuations

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 Company. 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 model to use. Second, due to the lack of observability of significant inputs, management must assess relevant empirical data in deriving valuation inputs including, but not limited to, transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents, as of December 31, 2019, the Company'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, for certain instruments, the weighted 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 Company 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 Company's view, the input range and the weighted average value do not reflect the degree of input uncertainty or an assessment of the reasonableness of the Company's estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Company 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 characteristics of the instruments held by the Company at each Consolidated Statement of Financial Condition date.

For the Company's derivatives and structured notes positions classified within level 3 at December 31, 2019, interest rate correlation inputs used in estimating fair value were distributed across the range; equity correlation, equity-FX correlation and equity-IR correlation inputs were concentrated in the middle of the range; and forward equity prices and IR-FX correlation inputs were distributed across the range. In addition, interest rate spread volatility inputs used in estimating fair value were distributed across the range and equity volatilities were concentrated towards the lower end of the range.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

Level 3 inputs^(a)

Product/instrument	Fair value (in millions)	Principal valuation technique	Unobservable inputs ^(f)	Range of input values			Weighted average
Securities received as collateral	\$ 23	Market comparables	Price	\$20	—	\$20	\$20
Residential mortgage-backed securities ^(b)	98	Discounted cash flows	Yield	2%	—	18%	3%
			Prepayment speed	5%	—	26%	13%
			Conditional default rate	0%	—	5%	4%
			Loss severity	20%	—	100%	90%
Commercial mortgage-backed securities ^(c)	3	Market comparables	Price	\$0	—	\$3	\$1
Obligations of U.S. states and municipalities	5	Market comparables	Price	\$71	—	\$99	\$88
Corporate debt securities	5	Market comparables	Price	\$0	—	\$100	\$19
Asset-backed securities	26	Market comparables	Price	\$1	—	\$102	\$87
Net interest rate derivatives	12	Option pricing	Interest rate spread volatility	20bps	—	30bps	
			Interest rate correlation	58%	—	83%	
			IR-FX correlation	(28)%	—	17%	
Net credit derivatives	(1)	Market comparables	Price	\$87	—	\$101	
Net foreign exchange derivatives	76	Option pricing	IR-FX correlation	60%	—	65%	
Net equity derivatives	(1,813)	Option pricing	Forward equity price ^(g)	92%	—	104%	
			Equity volatility	14%	—	47%	
			Equity correlation	10%	—	97%	
			Equity-FX correlation	(81)%	—	60%	
			Equity-IR correlation	25%	—	35%	
Other debt and equity instruments ^(d)	491	Option pricing	Interest rate correlation	58%	—	83%	
			IR-FX correlation	(28)%	—	17%	
			Equity correlation	10%	—	97%	
			Equity-FX correlation	(81)%	—	60%	
			Equity-IR correlation	25%	—	35%	
Obligation to return securities received as collateral	23	Market comparables	Price	\$20	—	\$20	\$20
Short-term borrowings and long-term debt ^(d)	\$ 7,550	Option pricing	Interest rate correlation	58%	—	83%	
			IR-FX correlation	(28)%	—	17%	
			Equity correlation	10%	—	97%	
			Equity-FX correlation	(81)%	—	60%	
			Equity-IR correlation	25%	—	35%	
Other level 3 assets and liabilities, net ^(e)	116						

(a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated Statement of Financial Condition. 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. GSEs and government agency securities of \$89 million and nonagency securities of \$9 million.

(c) Represents nonagency securities.

(d) Other debt and equity instruments predominantly include structured notes issued by affiliates of the Company. Short-term borrowings and long-term debt include structured notes issued to affiliates of the Company. These structured notes are predominantly financial instruments that contain embedded derivatives. The estimate of the fair value of the structured notes includes the derivative features embedded within the instruments. The significant unobservable inputs are broadly consistent with those presented for derivatives.

(e) Includes level 3 assets and liabilities, which mostly represent equity securities that are insignificant both individually and in aggregate.

(f) 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.

(g) Forward equity price is expressed as a percentage of the current equity price.

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, and where relationships exist between two unobservable inputs, those relationships are discussed below. Relationships may also

Notes to Consolidated Statement of Financial Condition

December 31, 2019

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.

In addition, the following discussion provides a description of attributes of the underlying instruments and external market factors that affect the range of the inputs used in the valuation of the Company'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.

The yield of a particular mortgage-backed security primarily reflects 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 the yield reflects the range of risk inherent in various instruments owned by the Company. 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 Fair Isaac Corporation ("FICO") scores, loan-to-value ("LTV") ratios for residential mortgages and the nature of the property and/or any tenants for commercial mortgages.

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, 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 Company'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. This includes the LTV, the nature of the lender's lien on the property and various other instrument-specific factors.

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 and foreign exchange) 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 range of correlation inputs between risks within the same asset class are generally narrower than those between underlying risks across asset classes. In addition, the ranges of credit correlation inputs tend to be narrower than those affecting other asset classes.

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

Notes to Consolidated Statement of Financial Condition

December 31, 2019

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. 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.

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.

Transfers between levels for instruments carried at fair value on a recurring basis

During the year ended December 31, 2019, significant transfers from level 2 into level 3 included the following:

- \$183 million of gross equity derivative receivables and \$440 million of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- \$246 million of long-term debt as a result of a decrease in observability and an increase in the significance of unobservable inputs for certain structured notes.

During the year ended December 31, 2019, significant transfers from level 3 into level 2 included the following:

- \$770 million of gross equity derivative receivables and \$930 million of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- \$239 million of long-term debt as a result of an increase in observability and a decrease in the significance of unobservable inputs for certain structured notes.

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 period in which they occur.

Additional disclosures about the fair value of financial instruments that are not carried at fair value on the Consolidated Statement of Financial Condition

U.S. GAAP requires disclosure of the estimated fair value of certain financial instruments, which are included in the following table. Certain financial instruments that are not carried at fair value on the Consolidated Statement of Financial Condition are carried at amounts that approximate fair value due to their short-term nature and generally negligible credit risk. These instruments include cash, securities purchased under resale agreements, securities borrowed, receivables from customers and from brokers, dealers, clearing organizations and others, other assets, short-term borrowings, securities sold under repurchase agreements, securities loaned, payables to customers and to brokers, dealers, clearing organizations and others, and other liabilities and accrued expenses.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

The following table presents by fair value hierarchy classification the carrying values and estimated fair values as of December 31, 2019, 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 millions)	Carrying value	Estimated fair value hierarchy			Total estimated fair value
		Level 1	Level 2	Level 3	
Financial assets					
Cash ^(a)	\$ 9,594	\$ 9,594	\$ —	\$ —	\$ 9,594
Securities purchased under resale agreements ^(a)	162,285	—	162,285	—	162,285
Securities borrowed	107,494	—	107,494	—	107,494
Receivables from customers	31,474	—	31,474	—	31,474
Receivables from brokers, dealers, clearing organizations and others ^(a)	14,650	—	14,650	—	14,650
Other assets	1,597	9	1,589	9	1,607
Financial liabilities					
Short-term borrowings	\$ 41,554	—	\$ 41,554	—	\$ 41,554
Securities sold under repurchase agreements	244,251	—	244,251	—	244,251
Securities loaned	5,357	—	5,357	—	5,357
Payables to customers	93,581	—	93,578	3	93,581
Payables to brokers, dealers, clearing organizations and others	10,187	—	10,187	—	10,187
Other liabilities and accrued expenses	1,498	—	1,496	2	1,498
Subordinated borrowings	24,000	—	24,290	—	24,290

(a) Includes cash and securities that were segregated or pledged to satisfy SEC and CFTC rules regarding the protection of assets of customers. Refer to Note 15 for further information.

4. Fair value option

The fair value option provides an option to elect fair value as an alternative measurement for selected financial assets, financial liabilities and unrecognized firm commitments.

The Company has elected to measure certain instruments at fair value for several reasons, including to mitigate income statement volatility caused by the differences in the measurement basis of elected instruments (e.g., certain instruments that otherwise would be accounted for on an accrual basis) while the associated risk management arrangements 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 Company's election of fair value includes the following instruments:

- Loans managed on a fair value basis.
- Certain securities financing agreements, such as those with an embedded derivative and/or a maturity of greater than one year.
- Certain debt and equity investments to better reflect those which are managed on a fair value basis.
- Structured notes, which are predominantly financial instruments that contain embedded derivatives.
- Certain long-term beneficial interests issued by consolidated securitization trusts where the underlying assets are carried at fair value.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

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, 2019, for loans reported as financial instruments owned and long-term debt for which the fair value option has been elected.

(in millions)	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding
Loans reported as financial instruments owned	\$ 68	\$ 66	\$ (2)
Long-term debt			
Principal-protected debt	\$ 1,199 ^(b)	\$ 1,257	\$ 58
Nonprincipal-protected debt ^(a)	NA	14,241	NA
Total long-term debt	NA	\$ 15,498	NA
Long-term beneficial interests issued by consolidated VIEs			
Nonprincipal-protected debt ^(a)	NA	\$ 35	NA
Total long-term beneficial interests issued by consolidated VIEs	NA	\$ 35	NA

(a) Remaining contractual principal is not applicable to nonprincipal-protected notes. Unlike principal-protected structured notes, for which the Company is obligated to return a stated amount of principal at the maturity of the note, nonprincipal-protected structured notes do not obligate the Company to return a stated amount of principal at maturity, but 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 Company as issuer for both nonprincipal-protected and principal-protected notes.

(b) Where the Company 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 Company's next call date.

5. Customer activities

Customer credit risks

The Company's activities for both clearing clients and customers, including affiliates (collectively "customers"), involve the execution, settlement and financing of customers' securities and derivative transactions. Derivative transactions primarily include futures, swaps, forwards, options and various structured products. The Company provides the ability for customers to execute and settle securities and derivative transactions on listed exchanges, as well as in the OTC markets. Securities and derivative transactions may be settled on a cash basis or financed on a margin basis. The collateral requirements on a margin loan are established based on either regulatory guidelines or internal risk-based requirements for clients that use leverage products offered by the Company.

In connection with certain customer activities, the Company executes and settles customer transactions involving the short sale of securities ("short sales"). When a customer sells a security short, the Company may be required to borrow securities to settle a customer short sale transaction and, as such, these transactions may expose the Company to a potential loss if customers are unable to fulfill their contractual obligations and customers' collateral balances are insufficient to fully cover their losses. In the event customers fail to satisfy their obligations, the Company may be required to purchase financial instruments at prevailing market prices to fulfill the customers' obligations.

It is the policy of the Company to mitigate the risks associated with its customers' activities by requiring customers to maintain margin collateral in compliance with various regulatory and internal guidelines. The Company monitors required margin levels and, pursuant to such guidelines, may require customers to deposit additional cash or other collateral, or to reduce positions, when deemed necessary. These transactions may expose the Company to a potential loss if customers are unable to fulfill their contractual obligations and customers' collateral balances are insufficient to fully cover their losses. The Company also establishes credit limits for customers and monitors compliance with such credit limits. Additional collateral is obtained when necessary. To further control these risks, the Company has developed automated risk control systems that analyze the customers' sensitivity to major market movements. The Company will require customers to deposit additional margin collateral, or reduce positions, if it is determined that customers' activities may be subject to above normal market risk. Additionally, with respect to the Company's correspondent clearing activities, introducing correspondent firms generally guarantee the contractual obligations of their customers. Further, it is the standard practice of the Company to reduce credit risk by entering into legally enforceable master netting agreements with customers, which permit receivables and payables with such customers to be offset in the event of a customer default.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

In connection with the Company's customer financing and securities settlement activities, the Company may pledge customers' securities as collateral to satisfy the Company's margin deposit requirements with exchanges or to support its various secured financing sources such as securities borrowings, securities loaned and repurchase agreements. In the event counterparties are unable to meet their contractual obligations to return customers' securities pledged as collateral, the Company may be exposed to the risk of acquiring the securities at prevailing market prices to satisfy its obligations to such customers. The Company seeks to control this risk by monitoring the market values of securities pledged and by requiring adjustments of collateral levels in the event of excess exposure. Moreover, the Company establishes credit limits for such activities and monitors compliance with such credit limits.

Concentrations of credit risks

The Company is engaged in providing securities processing services to a diverse group of individuals and institutional investors, including affiliates. A substantial portion of the Company's transactions are collateralized and may be executed with, or made on behalf of, institutional investors, including other brokers and dealers, commercial banks, insurance companies, pension plans, mutual funds, hedge funds and other financial institutions. The Company's exposure to credit risk associated with the nonperformance of customers in fulfilling their contractual obligations pursuant to securities and derivative transactions can be directly affected by volatile or illiquid trading markets, which may impair customers' ability to satisfy their obligations to the Company. The Company attempts to minimize credit risk associated with these activities by monitoring customers' credit exposure and collateral values and requiring, when deemed necessary, additional collateral to be deposited with the Company.

A significant portion of the Company's securities processing activities include clearing and settling transactions for hedge funds and other professional traders, including affiliates. Due to the nature of these operations, which may include significant levels of credit extension such as leveraged purchases, short selling and option writing, the Company may have significant credit exposure should these customers be unable to meet their commitments. In addition, the Company may be subject to concentration risk through providing margin to those customers holding large positions in certain types of securities, securities of a single issuer, including sovereign governments, issuers located in a particular country or geographic area or issuers engaged in a particular industry, where the Company receives such large positions as collateral. The Company seeks to control these risks by monitoring for concentration.

The Company acts as a clearing broker for securities and futures and options activities of certain affiliates on either a fully disclosed or omnibus basis. Such activities are conducted on either a cash or margin basis. The Company requires its affiliates to maintain margin collateral in compliance with various regulatory guidelines. The Company monitors required margin levels and requests additional collateral when deemed appropriate.

6. Derivative instruments

The Company makes markets in derivatives for clients and also uses derivatives to hedge or manage either its own risk exposures or that of affiliates. Predominantly all of the Company's derivatives are entered into for market-making or risk management purposes. 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.

Market-making derivatives

Clients use derivatives to mitigate or modify interest rate, credit, foreign exchange, equity and commodity risks. The Company actively manages the risks from its exposure to these derivatives by entering into other derivative transactions or by purchasing or selling other financial instruments that partially or fully offset the exposure from client derivatives.

Risk management derivatives

The Company manages certain market and credit risk exposures using derivative instruments.

The Company 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.

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. As a result of fluctuations in foreign currencies, the U.S. dollar-equivalent values of the foreign currency-denominated assets and liabilities increase or decrease.

Commodities derivatives may be used to manage the price risk of certain commodities-linked exchange-traded funds ("ETFs").

Notes to Consolidated Statement of Financial Condition

December 31, 2019

Credit derivatives are used to manage the counterparty credit risk associated with debt-related securities. 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 credit default swaps.

Derivative counterparties and settlement types

The Company enters into OTC derivatives, which are negotiated and settled bilaterally with the derivative counterparty. The Company also enters into, as principal, certain exchange-traded derivatives (“ETDs”) such as futures and options, and cleared over-the-counter (“OTC-cleared”) derivative contracts with central counterparties (“CCPs”). ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is the 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 Company provides clearing services for clients where the Company acts as a clearing member with respect to certain derivative exchanges and clearing houses. The Company does not reflect the clients’ derivative contracts on its Consolidated Statement of Financial Condition. Refer to Note 16 for further information on the Company’s clearing services.

Accounting for derivatives

All free-standing derivatives that the Company executes for its own account are required to be recorded on the Consolidated Statement of Financial Condition at fair value. As permitted under U.S. GAAP, the Company nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between the Company and the derivative counterparty. 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 Company does not have any derivatives that are designated as hedges.

Notional amount of derivative contracts

The following table summarizes the notional amount of derivative contracts outstanding as of December 31, 2019.

(in millions)	Notional amounts ^(b)
Interest rate contracts	
Swaps	\$ 313,065
Futures and forwards	418,548
Written options	3,134
Purchased options	1,318
Total interest rate contracts	736,065
Credit derivatives^(a)	31,260
Foreign exchange contracts	
Cross-currency swaps	2,522
Spot, futures and forwards	24,755
Written options	181
Purchased options	203
Total foreign exchange contracts	27,661
Equity contracts	
Swaps	179,314
Futures and forwards	58,481
Written options	359,881
Purchased options	341,551
Total equity contracts	939,227
Total derivative notional amounts	\$ 1,734,213

(a) For more information on volumes and types of credit derivative contracts, refer to the Credit derivative discussion in this Note.

(b) Represents the sum of gross long and gross short third-party and affiliate notional derivative contracts.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

While the notional amounts disclosed above give an indication of the volume of the Company's derivative activity, the notional amounts significantly exceed, in the Company'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.

Impact of derivatives on the Consolidated Statement of Financial Condition

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on the Company's Consolidated Statement of Financial Condition as of December 31, 2019, by contract type. This includes derivative receivables and payables with affiliates. Refer to Note 13 for further information on derivative balances with affiliates.

Derivative receivables and payables^(a)

(in millions)	Gross derivative receivables	Net derivative receivables ^(b)	Gross derivative payables	Net derivative payables ^(b)
Financial instruments owned and financial instruments sold, not yet purchased				
Interest rate	\$ 3,532	\$ 139	\$ 3,280	\$ 126
Credit	365	47	391	56
Foreign exchange	278	45	453	35
Equity	28,538	326	33,278	1,847
Total fair value of financial instruments owned and financial instruments sold, not yet purchased	\$ 32,713	\$ 557	\$ 37,402	\$ 2,064

(a) Balances exclude structured notes for which the fair value option has been elected. Refer to Note 4 for further information.

(b) As permitted under U.S. GAAP, the Company 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.

Derivatives netting

The following table presents, as of December 31, 2019, gross and net derivative receivables and payables by contract and settlement type under U.S. GAAP. Derivative receivables and payables, as well as the related cash collateral from the same counterparty have been netted on the Consolidated Statement of Financial Condition where the Company 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 under U.S. GAAP for netting on the Consolidated Statement of Financial Condition, and those derivative receivables and payables are shown separately in the following table.

In addition to the cash collateral received and transferred that is presented on a net basis with derivative receivables and payables, the Company receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with the Company's derivative instruments, but are not eligible for net presentation:

- collateral that consists of non-cash financial instruments (generally U.S. government and agency securities) and cash collateral held at third-party custodians, which are shown separately as "Collateral not nettable on the Consolidated Statement of Financial Condition" in the table below, up to the fair value exposure amount;
- the amount of collateral held or transferred exceeds the fair value exposure at the individual counterparty level, as of the date presented, which is excluded from the table 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 table below.

Notes to Consolidated Statement of Financial Condition
December 31, 2019

(in millions)	Derivative receivables			Derivative payables		
	Gross derivatives	Amounts netted on the Consolidated Statement of Financial Condition	Net derivatives	Gross derivatives	Amounts netted on the Consolidated Statement of Financial Condition	Net derivatives
U.S. GAAP nettable derivatives						
Interest rate contracts:						
OTC	\$ 3,245	\$ (3,223)	\$ 22	\$ 3,001	\$ (2,984)	\$ 17
OTC-cleared	198	(170)	28	170	(170)	—
Total interest rate contracts	3,443	(3,393)	50	3,171	(3,154)	17
Credit contracts:						
OTC	362	(318)	44	390	(335)	55
Total credit contracts	362	(318)	44	390	(335)	55
Foreign exchange contracts:						
OTC	240	(233)	7	434	(418)	16
Total foreign exchange contracts	240	(233)	7	434	(418)	16
Equity contracts:						
OTC	18,677	(18,351)	326	22,021	(21,570)	451
Exchange-traded ^(a)	9,861	(9,861)	—	11,257	(9,861)	1,396
Total equity contracts	28,538	(28,212)	326	33,278	(31,431)	1,847
Derivatives with appropriate legal opinion	32,583	(32,156)	427 ^(d)	37,273	(35,338)	1,935 ^(d)
Derivatives where an appropriate legal opinion has not been either sought or obtained	130		130	129		129
Total derivatives recognized on the Consolidated Statement of Financial Condition	\$ 32,713		\$ 557	\$ 37,402		\$ 2,064
Collateral not nettable on the Consolidated Statement of Financial Condition ^{(b)(c)}			(48)			(1)
Net amounts			\$ 509			\$ 2,063

(a) Exchange-traded derivative balances that relate to futures contracts are settled daily.

(b) Represents liquid security collateral as well as 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 receivable and derivative payable balances. Where this is the case, the total amount reported is limited to the net derivative receivable and net derivative payable balances with that counterparty.

(c) Derivative collateral relates only to OTC and OTC-cleared derivative instruments.

(d) Net derivative receivables included cash collateral netted of \$571 million and net derivative payables included cash collateral netted of \$3.8 billion. Derivative cash collateral relates to OTC and OTC-cleared derivative instruments.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose the Company 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 Company proves to be of insufficient value to cover the payment obligation. It is the policy of the Company to actively pursue, where possible, the use of legally enforceable master netting agreements and collateral agreements to mitigate derivative counterparty credit risk inherent in derivative receivables.

While derivative receivables expose the Company to credit risk, derivative payables expose the Company to liquidity risk, as the derivative contracts typically require the Company to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor. Where the Company has legally enforceable master netting agreements and margin agreements with its affiliates, any associated derivatives are marked to market daily and the fair value of the related collateral is monitored with margin calls made daily between the Company and the affiliates.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

The aggregate fair value of net derivative payables that contain contingent collateral or termination features that may be triggered upon a ratings downgrade of the Company or its affiliates at December 31, 2019, was not material.

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 Company is both a purchaser and seller of protection in the credit derivatives market. The Company uses credit derivatives primarily to manage the credit risk arising from certain financial instruments including corporate debt securities and mortgage-backed securities in the Company's market-making businesses. Additionally, the Company enters into derivative transactions in its capacity as a market-maker.

Credit default swaps

Credit derivatives may reference the credit of either a single reference entity ("single-name") or a broad-based index. The Company 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.

The following table presents a summary of the notional amounts of credit derivatives the Company sold and purchased as of December 31, 2019.

The Company does not use notional amounts of credit derivatives as the primary measure of risk management for such derivatives because notional amount does not take into account the probability of 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 Company's view, the risk associated with such derivatives.

Total credit derivatives

(in millions)	Maximum payout/Notional amount			
	Protection sold	Purchased protection with identical underlyings ^(b)	Net protection (sold)/purchased ^(c)	Other protection purchased ^(d)
Credit derivatives				
Credit default swaps	\$ (14,413)	\$ 15,032	\$ 619	\$ 135
Other credit derivatives ^(a)	—	—	—	1,680
Total	\$ (14,413)	\$ 15,032	\$ 619	\$ 1,815

(a) Represents total return swaps with affiliates.

(b) Represents the 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.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

- (c) 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.
- (d) Represents protection purchased by the Company on referenced instruments (single-name, portfolio or index) where the Company has not sold any protection on the identical reference instrument.

The following table summarizes the notional and fair value amounts of credit derivatives as of December 31, 2019, where the Company 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 the Company is the purchaser of protection are comparable to the profile reflected in the following table.

Protection sold – credit derivatives ratings^(a)/maturity profile

(in millions)	Under 1 year	1 - 5 years	After 5 years	Total notional amount	Fair value receivables ^(b)	Fair value payables ^(b)	Net fair value
Risk rating of reference entity							
Investment-grade	\$ –	\$ (10)	\$ (10,440)	\$ (10,450)	\$ 86	\$ (91)	\$ (5)
Noninvestment-grade	–	–	(3,963)	(3,963)	12	(181)	(169)
Total	\$ –	\$ (10)	\$ (14,403)	\$ (14,413)	\$ 98	\$ (272)	\$ (174)

(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 and cash collateral received by the Company.

7. Employee benefits and compensation

The Company's employees participate, to the extent they meet minimum eligibility requirements, in various benefit plans sponsored by JPMorgan Chase and its affiliates. The following is a discussion of JPMorgan Chase's significant benefit plans.

Pension and other postretirement employee benefits

JPMorgan Chase and its affiliates have various defined benefit pension plans and other postretirement employee benefit ("OPEB") plans that provide benefits to its employees. The Company's employees are eligible to participate in a qualified noncontributory U.S. defined benefit pension plan sponsored by JPMorgan Chase Bank, National Association, and they may also participate in JPMorgan Chase's defined contribution plan. In connection with changes to the U.S. Retirement Savings Program during the fourth quarter of 2018, JPMorgan Chase announced that it will freeze the U.S. defined benefit pension plan. Commencing on January 1, 2020 (and January 1, 2019 for new hires), new pay credits will be directed to the U.S. defined contribution plan. Interest credits on the U.S. defined benefit pension plan will continue to accrue. In addition, postretirement medical and life insurance benefits are offered to certain retirees, and postretirement medical benefits are offered to qualifying U.S. employees, through JPMorgan Chase's U.S. OPEB plans. There are no separate plans solely for employees of the Company and, therefore, pension expense, defined contribution expense and OPEB expense for the Company is determined based upon employee participation in these plans and are recorded through an intercompany charge, which is settled in cash monthly.

Employee share-based awards

Certain employees of the Company participate in JPMorgan Chase's long-term share-based incentive plans, which provide for grants of common share-based awards, including restricted stock units ("RSUs"), employee stock-settled stock appreciation rights ("SARs") and stock options. Employees receive annual incentive compensation based on their performance, the performance of their business and JPMorgan Chase's consolidated operating results.

U.S. GAAP requires all share-based payments to employees that qualify as equity awards be measured at their grant-date fair values. Generally, grant date fair value for RSUs is measured based on the number of units granted multiplied by the stock price at the grant date. The Company uses the Black-Scholes valuation model to estimate the fair value of employee SARs and stock options at the grant date. The Company 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 Company 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

Notes to Consolidated Statement of Financial Condition

December 31, 2019

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.

JPMorgan Chase RSUs

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 JPMorgan Chase 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.

JPMorgan Chase employee SARs and stock options

Employee 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. Prior grants of employee SARs generally become exercisable ratably over five years (i.e., 20% per year) and contain full-career eligibility provisions and clawback provisions similar to RSUs. Employee SARs generally expire ten years after the grant date. There were no material grants of employee SARs or stock options in 2019.

The following table presents grant and forfeiture activity of JPMorgan Chase share-based awards to the Company's employees for the year ended December 31, 2019.

(in thousands)

RSUs	
Granted	5,364
Forfeited	272

At December 31, 2019, the Company's employees held 12 million unvested RSUs. In addition, 566 thousand employee SARs and stock options were held by the Company's employees at December 31, 2019, of which all awards have vested. In the normal course of business, the employment relationship of certain employees may transfer between the Company and JPMorgan Chase or its subsidiaries which may impact the Company's outstanding awards.

8. Securities financing activities

The Company enters into securities financing agreements primarily to finance the Company's inventory positions, acquire securities to cover short positions, accommodate customers' financing needs, and settle other securities obligations.

Resale and repurchase agreements are carried on the Consolidated Statement of Financial Condition at the amounts at which the securities will be subsequently sold or repurchased, except for amounts reported at fair value. Where appropriate under applicable accounting guidance, resale and repurchase agreements with the same counterparty are reported on a net basis. Refer to Note 2 for further information on the offsetting of assets and liabilities.

The Company has elected the fair value option for certain resale and repurchase agreements. Refer to Note 4 for further information on the fair value option.

Securities borrowed and securities loaned are generally carried at the amount of cash collateral advanced or received. In accordance with U.S. GAAP, certain securities are borrowed against securities collateral and the borrower is not required to record the transactions on its Consolidated Statement of Financial Condition. Certain securities are loaned against securities collateral, and the lender is required to record the securities received as collateral and the related obligation to return securities received as collateral on its Consolidated Statement of Financial Condition.

Securities financing agreements expose the Company primarily to credit and liquidity risk. To manage these risks, the Company monitors the value of the underlying securities (predominantly high-quality securities collateral, including government-issued debt and U.S. GSEs and government agency mortgage-backed securities) 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.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

In resale agreements and securities borrowed transactions, the Company 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 agreements and securities loaned transactions, credit risk exposure arises to the extent that the value of underlying securities exceeds the value of the initial cash principal advanced and any collateral amounts exchanged.

Additionally, the Company 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 Company's policy to take possession, where possible, of the securities underlying resale agreements and securities borrowed transactions.

The following table summarizes the gross and net amounts of the Company's securities financing agreements as of December 31, 2019. When the Company has obtained an appropriate legal opinion with respect to the master netting agreement with a counterparty and where other relevant netting criteria under U.S. GAAP are met, the Company nets, on the Consolidated Statement of Financial Condition, the balances outstanding under its securities financing agreements with the same counterparty. In addition, the Company exchanges securities and/or cash collateral with its counterparties; this collateral also reduces, in the Company's view, the economic exposure with the counterparty. Such collateral, along with securities financing balances that do not meet relevant netting criteria under U.S. GAAP, are presented as "Amounts not nettable on the Consolidated Statement of Financial Condition", and reduce the "Net amounts" presented in the following table, if the Company has an appropriate legal opinion with respect to the master netting agreement with the counterparty. Where a legal opinion has not been either sought or obtained, the securities financing balances are presented gross in the "Net amounts" in the following table, and related collateral does not reduce the amounts presented.

(in millions)	Gross amounts	Amounts netted on the Consolidated Statement of Financial Condition	Amounts presented on the Consolidated Statement of Financial Condition	Amounts not nettable on the Consolidated Statement of Financial Condition ^(c)	Net amounts ^(d)
Assets					
Securities purchased under resale agreements ^(a)	\$ 412,560	\$ (236,142)	\$ 176,418	\$ (174,180)	\$ 2,238
Securities borrowed	133,130	(25,636)	107,494	(77,552)	29,942
Liabilities					
Securities sold under repurchase agreements	\$ 480,639	\$ (236,142)	\$ 244,497	\$ (220,948)	\$ 23,549
Securities loaned	30,993	(25,636)	5,357	(5,341)	16
Obligation to return securities received as collateral ^(b)	3,550	—	3,550	(3,550)	—

(a) Includes securities that were segregated to satisfy SEC rules regarding the protection of assets of customers. Refer to Note 15 for further information.

(b) Represents securities-for-securities lending transactions when the Company is acting as the lender with the corresponding asset recognized as securities received as collateral, at fair value on the Consolidated Statement of Financial Condition.

(c) 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 asset or liability with that counterparty.

(d) 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, 2019, included \$799 million of securities purchased under resale agreements; \$28.0 billion of securities borrowed; \$22.4 billion of securities sold under repurchase agreements; and \$11 million of securities loaned.

Notes to Consolidated Statement of Financial Condition
December 31, 2019

The following tables present, as of December 31, 2019, the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

(in millions)	Gross liability balance		
	Securities sold under repurchase agreements	Securities loaned	Obligation to return securities received as collateral ^(a)
Mortgage-backed securities			
U.S. GSEs and government agencies	\$ 88,832	\$ —	\$ —
Residential - nonagency	1,441	—	—
Commercial - nonagency	2,038	—	—
U.S. Treasury, GSEs and government agencies	356,254	29	—
Obligations of U.S. states and municipalities	1,181	—	—
Non-U.S. government debt securities	35	58	—
Corporate debt securities	7,213	1,111	470
Equity securities	21,332	29,795	3,080
Asset-backed securities	2,313	—	—
Total	\$ 480,639	\$ 30,993	\$ 3,550

(in millions)	Remaining contractual maturity of the agreements				
	Overnight and continuous	Up to 30 days	30-90 days	Greater than 90 days	Total
Securities sold under repurchase agreements	\$ 263,790	\$ 89,243	\$ 58,893	\$ 68,713	\$ 480,639
Securities loaned	29,858	80	755	300	30,993
Obligation to return securities received as collateral ^(a)	3,550	—	—	—	3,550

(a) Represents securities-for-securities lending transactions when the Company is acting as the lender with the corresponding asset recognized as securities received as collateral, at fair value on the Consolidated Statement of Financial Condition.

9. Variable interest entities

For a further description of the Company's accounting policies regarding consolidation of VIEs, refer to Note 2.

This Note summarizes the most significant types of JPMorgan Chase-sponsored VIEs. JPMorgan Chase considers a "sponsored" VIE to include any entity where: (1) JPMorgan Chase is the principal beneficiary of the structure; (2) the VIE is used by JPMorgan Chase to securitize its assets; (3) the VIE issues financial instruments using JPMorgan Chase's name; or (4) the entity is a JPMorgan Chase-administered asset-backed commercial paper conduit.

Mortgage and other securitization trusts

The Company engages in underwriting and trading activities involving securities issued by JPMorgan Chase-sponsored securitization trusts. As a result, the Company at times retains senior and/or subordinated interests (including residual interests) in residential and commercial mortgage securitizations upon 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, when considered together with the power to direct the activities of the VIEs, the Company is deemed to be the primary beneficiary of certain securitization trusts.

The Company does not service the underlying residential or commercial loans, and it does not consolidate the mortgage securitization trusts as it does not have the power to direct the significant activities of the VIE which are generally held by the servicer or investors in a specified class of securities ("controlling class").

The following table presents at December 31, 2019, the total unpaid principal amount of assets held in JPMorgan Chase-sponsored private-label securitization entities, including those in which the Company has continuing involvement. The Company's continuing involvement includes holding senior interests or subordinated interests and derivative transactions.

Notes to Consolidated Statement of Financial Condition
December 31, 2019

(in millions)	Principal amount outstanding	JPMorgan Chase interest in securitized assets in nonconsolidated VIEs ^{(c)(d)(e)}
	Assets held in nonconsolidated securitization VIEs with continuing involvement	Financial instruments owned
Securitization-related^(a)		
Residential mortgage:		
Prime/Alt-A and option adjustable rate mortgages ("ARMs")	\$ 16,652	\$ 218
Subprime	146	7
Commercial and other ^(b)	68,073	627
Total	\$ 84,871	\$ 852

(a) Excludes U.S. GSEs and government agency securitizations and re-securitizations, which are not JPMorgan Chase-sponsored.

(b) Consists of securities backed by commercial loans (predominantly real estate) and non-mortgage-related consumer receivables purchased from third-parties.

(c) Excludes the following: securities retained from loan sales 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 \$106 million and \$94 million, respectively, which the Company purchased in connection with secondary market-making activities.

(d) Includes interests held in re-securitization transactions.

(e) As of December 31, 2019, 62% of the Company's retained securitization interests, which are carried at fair value, were risk-rated "A" or better, on an S&P-equivalent basis. The retained interests in prime residential mortgages consisted of \$177 million of investment-grade and \$41 million of noninvestment-grade retained interests. The retained interests in commercial and other securitizations trusts consisted of \$421 million of investment-grade and \$206 million of noninvestment-grade retained interests.

Re-securitizations

The Company 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 Company's consolidation analysis is largely dependent on the Company's role and interests in the re-securitization trusts.

The following table presents, for the year ended December 31, 2019, the principal amount of securities transferred to re-securitization VIEs.

(in millions)	
Transfers of securities to VIEs	
U.S. GSEs and government agencies	\$ 25,852

Most re-securitizations with which the Company is involved are client-driven transactions in which a specific client or group of clients are seeking a specific return or risk profile. For these transactions, the Company has concluded that the decision-making power of the entity is shared between the Company 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 Company does not consolidate the re-securitization VIE.

The Company did not transfer any private label securities to re-securitization VIEs during 2019, and retained interests in any such JPMorgan Chase-sponsored VIEs as of December 31, 2019 were immaterial.

Additionally, the Company may invest in beneficial interests of third-party-sponsored re-securitizations and generally purchases these interests in the secondary market. In these circumstances, the Company 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 Company is involved with an independent third-party-sponsor and demonstrates shared power over the creation of the trust; therefore, the Company does not consolidate the re-securitization VIE.

The following table presents information on nonconsolidated re-securitization VIEs at December 31, 2019.

(in millions)	
U.S. GSE and government agencies	
Interest in VIEs	\$ 2,928

Notes to Consolidated Statement of Financial Condition

December 31, 2019

As of December 31, 2019, the Company did not consolidate any U.S. GSE and government agency re-securitization VIEs or any JPMorgan Chase-sponsored private-label re-securitizations VIEs.

Consolidated VIE assets and liabilities

The following table presents information on assets and liabilities related to VIEs consolidated by the Company as of December 31, 2019.

(in millions)	Assets	Liabilities
	Financial instruments owned ^(b)	Beneficial interests issued by consolidated VIEs ^(c)
Mortgage securitization entities ^(a)	\$66	\$35
Other securitization entities	382	—
Total	\$448	\$35

(a) Represents residential mortgage securitizations.

(b) 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-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation.

(c) The holders of the beneficial interests do not have recourse to the general credit of the Company.

10. Short-term borrowings

The following is a summary of the Company's variable rate short-term borrowings, which have maturities of less than one year, at December 31, 2019.

	Amount (in millions)	Interest rates	Secured/unsecured
Commercial paper ^(a)	\$ 14,754	1.84 - 2.72% ^(b)	Unsecured
Short-term borrowings with third-parties	15,508	1.88 - 2.84% ^(b)	Secured ^(e)
Short-term borrowings with the IHC	11,119	1.55 - 1.97% ^(c)	Unsecured
Structured notes payable to affiliates	2,905	Various ^(d)	Unsecured
Other	173	NA	Unsecured
Total	\$ 44,459		

(a) Maturities ranged from January 2020 to November 2020.

(b) Includes U.S. dollar denominated notes predominantly issued at a spread to either the one-month or three-month London Interbank Borrowing Offered Rate ("LIBOR") depending on the tenor of issuance.

(c) As of December 31, 2019, \$8.1 billion of borrowings bear interest at rates approximating the U.S. Federal Funds Effective Rate pursuant to a committed \$18.0 billion credit facility and \$3.0 billion of borrowings bear interest at a spread to one-month LIBOR pursuant to a term borrowing agreement.

(d) The interest rates are based primarily on the performance of a single equity security or basket of equity securities, or an equity index. The Company has elected to measure these instruments at fair value under the fair value option.

(e) These borrowings are secured by certain financial instruments owned and securities received in as collateral.

11. Long-term debt

The following is a summary of the Company's unsecured long-term structured notes payable to affiliates at December 31, 2019. The interest rates are based primarily on the performance of a single equity security or basket of equity securities, or an equity index. The Company has elected to measure these instruments at fair value under the fair value option.

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, 2019.

(in millions)		Under 1 year	1 - 5 years	After 5 years	Total
Long-term debt	Variable rate notes	\$ 5,387	\$ 8,853	\$ 1,258	\$ 15,498

Notes to Consolidated Statement of Financial Condition

December 31, 2019

12. Subordinated borrowings

At December 31, 2019, the Company had \$24.0 billion of subordinated borrowings payable to the IHC under subordinated borrowing agreements, and they mature as follows.

	Amount (in millions)	Interest rates	Term ^(c)
Debt subordination	\$ 16,000	2.61% ^(a)	01/31/2021
Equity subordination	8,000	3.28% ^(b)	11/30/2021
Total subordinated borrowings	\$ 24,000		

(a) Includes spreads over three-month LIBOR depending on the tenor of issuance.

(b) Includes spreads over one-month LIBOR depending on the tenor of issuance.

(c) The dates represent the current maturity dates of each borrowing. The scheduled maturity dates will be automatically extended unless notification to not extend is given by the relevant party to the borrowings under the provisions of each agreement.

All subordinated borrowings of the Company have been approved by the Financial Industry Regulatory Authority ("FINRA") and the Chicago Mercantile Exchange ("CME"), and therefore, qualify as capital in computing net capital under the SEC's Uniform Net Capital Rule ("Net Capital Rule"). The subordinated borrowing obligations may only be repaid if the Company is in compliance with the applicable terms of the Net Capital Rule.

13. Related parties

The Company regularly enters into transactions with JPMorgan Chase affiliates. These JPMorgan Chase affiliates engage the Company to arrange for the purchase or sale of securities, clearing activities, collateralized transactions, manage portfolios of securities, market derivative instruments, structure complex transactions and provide and receive operational support and services. Balances with related parties as of December 31, 2019, are listed in the following table.

(in millions)

Assets		
Cash ^(a)	\$	9,066
Securities purchased under resale agreements (included \$5,254 at fair value)		49,354
Securities borrowed		3,314
Receivables from brokers, dealers, clearing organizations and others		2,395
Financial instruments owned, at fair value ^(b)		2,500
Liabilities		
Short-term borrowings (included \$2,905 at fair value)	\$	14,055
Securities sold under repurchase agreements		91,521
Securities loaned		3,155
Payables to customers		15,136
Payables to brokers, dealers, clearing organizations and others		4,867
Financial instruments sold, not yet purchased, at fair value ^(b)		290
Other liabilities and accrued expenses		310
Long-term debt, at fair value		15,498
Subordinated borrowings		24,000

(a) Includes cash that was segregated to satisfy CFTC rules regarding the protection of assets of customers. Refer to Note 15 for further information.

(b) Financial instruments owned includes \$2.2 billion of structured notes from affiliates, \$272 million of corporate debt obligations and \$2 million of derivative receivables from affiliates. Financial instruments sold, not yet purchased includes \$133 million of corporate debt obligations and \$157 million of derivative payables to affiliates.

14. Income taxes

At December 31, 2019, the Company had a deferred tax asset of \$383 million primarily from compensation-related benefits. As of December 31, 2019, management has determined it is more likely than not that the Company will realize its deferred tax assets.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

At December 31, 2019, the Company had a net current federal income tax payable of \$282 million and a U.S. state income tax payable of \$71 million to JPMorgan Chase included on the Consolidated Statement of Financial Condition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits for the year ended December 31, 2019.

(in millions)	Unrecognized tax benefits
Balance at January 1, 2019	\$ 350
Increases based on tax positions related to the current period	163
Decreases based on tax positions related to prior periods	(175)
Balance at December 31, 2019	\$ 338

At December 31, 2019, the Company's unrecognized tax benefit, excluding related interest expense and penalties, was \$338 million, of which \$167 million, if recognized, would reduce the annual effective tax rate.

At December 31, 2019, in addition to the Company's liability for unrecognized tax benefits, the Company had accrued \$48 million for income tax-related interest and no penalties.

The Company is a member of the JPMorgan Chase consolidated group which is continually under examination by the Internal Revenue Service 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, 2019.

Tax examinations	Periods under examination	Status
JPMorgan Chase - U.S.	2011 - 2013	Field examination completed; JPMorgan Chase intends to file amended returns
JPMorgan Chase - U.S.	2014 - 2016	Field examination
JPMorgan Chase - New York State	2012 - 2014	Field examination
JPMorgan Chase - New York City	2012 - 2014	Field examination
JPMorgan Chase - California	2011 - 2012	Field examination

15. Regulatory requirements

J.P. Morgan Securities is a registered broker-dealer and FCM and, accordingly, is subject to regulatory capital requirements, including those imposed by the SEC, CFTC, FINRA and the NFA.

SEC Rule 15c3-1 and CFTC Rule 1.17 specify minimum net capital requirements. Under these rules, J.P. Morgan Securities is required to maintain minimum net capital, as defined, under SEC Rule 15c3-1, of not less than the greater of \$500 million or 2% of aggregate debit items arising from customer transactions, or, as defined in CFTC Rule 1.17, 8% of customer risk maintenance margin requirements plus 8% of non-customer risk maintenance margin requirements. Excess margin collateral collected on resale agreements, as defined in SEC Rule 15c3-1, is also added to the minimum requirement.

The SEC has approved J.P. Morgan Securities' use of Appendix E of the Net Capital Rule, which establishes alternative net capital requirements for broker-dealers that are part of entities subject to consolidated supervision at the ultimate holding company level. Appendix E allows J.P. Morgan Securities to calculate net capital charges for market risk and derivatives-related credit risk based on mathematical models provided that it holds tentative net capital in excess of \$1.0 billion and net capital in excess of \$500 million. J.P. Morgan Securities is also required to notify the SEC in the event that tentative net capital is less than \$5.0 billion. FINRA may require a member firm to reduce its business if its net capital is less than 4% of aggregate debit items and may prohibit a member firm from expanding its business or paying capital distributions if its net capital is less than 5% of aggregate debit items.

At December 31, 2019, J.P. Morgan Securities' net capital of \$21.1 billion exceeded the minimum net capital requirement of \$3.8 billion by \$17.3 billion.

Customers of J.P. Morgan Securities are protected under SEC Rule 15c3-3 of the Securities Exchange Act of 1934. As of December 31, 2019, qualified securities segregated in a special reserve account for the exclusive benefit of customers was \$8.8 billion. The qualified securities included \$8.7 billion of securities purchased under resale agreements and \$93 million of financial instruments owned on the Consolidated Statement of Financial Condition.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

J.P. Morgan Securities also performs the computation for assets in the proprietary accounts of broker-dealers (“PAB”) in accordance with the PAB reserve computation set forth in SEC Rule 15c3-3 under the Securities Exchange Act of 1934, so as to enable introducing brokers to include PAB assets as allowable assets in their net capital computations (to the extent allowable under the Net Capital Rule). As of December 31, 2019, there was no required deposit for the proprietary accounts of brokers, and therefore no cash or securities were on deposit.

Additionally, J.P. Morgan Securities, in its capacity as an FCM must segregate amounts due to its customers as required under 4d(a)(2) and 4d(f) of the Commodity Exchange Act and Commission Regulation 30.7. Cash and securities, including those owned by customers, segregated under these regulations as of December 31, 2019 totaled \$48.8 billion, which exceeded requirements by \$2.4 billion. The assets included \$8.5 billion of cash, \$18.8 billion of financial instruments owned and \$2.9 billion of net receivables from brokers, dealers, clearing organizations and others. The assets also included \$18.6 billion of customer owned assets which are not reflected on the Consolidated Statement of Financial Condition.

The Company prepares its Financial and Operational Combined Uniform Single (“FOCUS”) Report on an unconsolidated basis. The following is a summary of certain consolidating financial information of the Company at December 31, 2019.

(in millions)	J.P. Morgan Securities (FOCUS Report)	J.P. Morgan Prime (FOCUS Report)	Eliminations	Company
Total assets	\$ 516,774	\$ 33,539	\$ (59,368)	\$ 490,945
Total liabilities ^(a)	504,991	33,270	(59,099)	479,162
Total equity	11,783	269	(269)	11,783
Total liabilities and equity	\$ 516,774	\$ 33,539	\$ (59,368)	\$ 490,945

(a) Includes subordinated borrowings.

16. Commitments, guarantees, pledged assets, collateral and contingencies

The Company provides various commitments and guarantees to meet the financing needs of its customers. The contractual amount of these financial instruments represents the maximum possible credit risk to the Company should the counterparty draw upon the commitment or the Company be required to fulfill its obligation under the guarantee, and should the counterparty subsequently fail to perform according to the terms of the contract. Most of these commitments and guarantees expire without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Company’s view, representative of its actual future credit exposure or funding requirements.

The following table summarizes the contractual amounts and carrying values of commitments and guarantees at December 31, 2019.

(in millions)	Contractual amount					Carrying value
	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	
Commitments and guarantees						
Unfunded commitments to extend credit ^(a)	\$ 1,241	\$ —	\$ —	\$ —	\$ 1,241	\$ —
Derivatives qualifying as guarantees	61	22	—	—	83	2
Unsettled securities purchased under resale and securities borrowing agreements	44,645	80	—	—	44,725	—
Unsettled securities sold under repurchase and securities lending agreements	17,295	—	—	—	17,295	—
Exchange and clearing house guarantees and commitments ^(b)	105,275	—	—	—	105,275	—
Other guarantees	15	—	—	—	15	—

(a) Represents committed customer margin lending facilities.

(b) Includes guarantees to the Fixed Income Clearing Corporation under the sponsored member repo program and commitments and guarantees associated with the Company’s membership in certain clearing houses.

Notes to Consolidated Statement of Financial Condition

December 31, 2019

Committed customer margin lending facilities

Committed customer margin lending facilities are conditional lending commitments issued by the Company for secured financings. The Company has such facilities in place with certain customers and certain clearing houses of which it is a member. The Company does not hold collateral to support undrawn commitments under these facilities. However, before advancing funds the Company takes possession of collateral (generally securities) and continues to monitor the market value of the collateral during the term of the financing, which includes requesting or returning additional collateral when appropriate.

Derivatives qualifying as guarantees

The Company transacts certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. These contracts include written put options that require the Company to purchase assets upon exercise by the option holder at a specified price by a specified date in the future. The Company 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.

The fair value of derivative guarantees reflects the probability, in the Company's view, of whether the Company will be required to perform under the contract. The Company 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.

In addition to derivative contracts that meet the characteristics of a guarantee, the Company is both a purchaser and seller of credit protection in the credit derivatives market. Refer to Note 6 for further information on credit derivatives.

Unsettled securities financing agreements

In the normal course of business, the Company enters into unsettled securities purchased under resale and securities borrowing agreements, and unsettled securities sold under repurchase and securities lending agreements, that settle at a future date. At settlement, these commitments require that the Company advance cash to and accept securities from the counterparty. These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated Statement of Financial Condition until settlement date. Refer to Note 8 for further information on securities financing agreements.

Clearing services

The Company provides clearing services for clients entering into securities purchases and sales, and derivative transactions with CCPs, including ETDs such as futures and options, as well as OTC-cleared derivative contracts. As a clearing member, the Company 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 Company 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 Company seeks to mitigate its risks to clients through the collection of appropriate amounts of margin at inception and throughout the life of the transactions. The Company may cease providing clearing services to a client if the client does not adhere to their obligations under the clearing agreement. In the event of nonperformance by a client, the Company 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 Company as a clearing member.

The Company reflects its exposure to nonperformance risk of clients through margin payables to CCPs and corresponding receivables from clients, but does not reflect the clients' underlying securities or derivative contracts on its Consolidated Statement of Financial Condition.

It is difficult to estimate the Company'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 on credit risk management practices and historical experience, and the credit risk mitigants available to the Company, management believes it is unlikely that the Company will have to make any material payments under these arrangements and the risk of loss is expected to be remote.

Refer to Note 6 for information on the derivatives that the Company executes for its own account and records on its Consolidated Statement of Financial Condition.

Exchange and clearing house memberships

The Company 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 Company 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

Notes to Consolidated Statement of Financial Condition

December 31, 2019

organizations. These obligations may be limited to the amount (or a multiple of the amount) of the Company'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 Company 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 Company's maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against the Company that have not yet occurred. However, based on historical experience, management expects the risk of loss to the Company to be remote. Where the Company's maximum possible exposure can be estimated, the amount is disclosed in the previous table in exchange and clearing house guarantees and commitments.

Sponsored member repo program

In 2019 the Company commenced the sponsored member repo program, wherein the Company acts as a sponsoring member to clear eligible overnight 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 Company 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 Company minimizes its liability under these overnight guarantees by obtaining a security interest in the cash or high-quality securities collateral that the clients place with the clearing house; therefore, the Company expects the risk of loss to be remote. The Company's maximum possible exposure, without taking into consideration the associated collateral, is included in the previous table in exchange & clearing house guarantees and commitments. For additional information on credit risk mitigation practices on resale agreements and the types of collateral pledged under repurchase agreements, refer to Note 8.

Guarantees of subsidiaries

In the normal course of business, J.P. Morgan Securities may guarantee certain of the obligations of its consolidated subsidiaries. The obligations of the consolidated subsidiaries are included on the Company's Consolidated Statement of Financial Condition; therefore, the Company has not recognized a separate liability for these guarantees. The Company believes that the occurrence of any event that would trigger payments under these guarantees is remote.

Pledged assets

The Company pledges or otherwise uses financial assets to collateralize repurchase and other securities financing agreements, to cover short sales, to collateralize derivative contracts and to satisfy margin deposits at clearing and depository organizations. Certain of these pledged assets may be sold or repledged or otherwise used by the secured parties and are parenthetically identified on the Consolidated Statement of Financial Condition.

The following table presents the Company's pledged assets at December 31, 2019.

(in millions)

Assets that may be sold or repledged or otherwise used by secured parties	\$	69,751
Assets that may not be sold or repledged or otherwise used by secured parties		59,342
Total pledged assets	\$	129,093

Total pledged assets do not include assets of consolidated VIEs; these assets are used to settle the liabilities of those entities. Refer to Note 9 for additional information on assets and liabilities of consolidated VIEs.

Collateral

The Company 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, customer margin loans and derivative contracts. Collateral is generally used under repurchase and other securities financing agreements, to cover short sales, and to collateralize derivative contracts. In many instances, the Company is permitted to rehypothecate the financial assets it received as collateral, subject to regulations which prohibit the rehypothecation of customer fully-paid and excess margin securities, as set forth in customer protection SEC Rule 15c3-3.

Notes to Consolidated Statement of Financial Condition
December 31, 2019

The following table presents the fair value of collateral accepted at December 31, 2019.

(in millions)

Collateral that is permitted to be sold or repledged, delivered, or otherwise used	\$	780,395
Collateral sold or repledged, delivered, or otherwise used ^(a)		695,147

(a) Includes securities that were segregated to satisfy SEC rules regarding the protection of assets of customers. Refer to Note 15 for further information.

Litigation

The Company is a defendant in a number of legal proceedings. The Company 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 Company has established reserves for certain of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, the Company 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 Company evaluates its outstanding legal proceedings each quarter to assess its litigation reserves, and makes adjustments in such reserves, upwards or downward, as appropriate, based on management's best judgment after consultation with counsel. There is no assurance that the Company'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, the Company 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. The Company believes, based upon its current knowledge and after consultation with counsel, and after taking into account its current litigation reserves and its estimated aggregate range of possible losses, that the legal proceedings currently pending against it should not have a material adverse effect on the Company's consolidated financial condition. The Company 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 the Company's operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of the Company's income for that period.

The Company believes the aggregate range of reasonably possible losses, in excess of reserves established, is not material based upon currently available information for those proceedings in which the Company believes that an estimate of reasonably possible loss can be made.

17. Subsequent events

The Company has performed an evaluation of events that have occurred subsequent to December 31, 2019, and through March 2, 2020 (the date of the filing of this report). There have been no material subsequent events that occurred during such period that would require disclosure or recognition on the Consolidated Statement of Financial Condition as of December 31, 2019.

J.P. Morgan Securities LLC and Subsidiaries

(an indirect wholly-owned subsidiary of JPMorgan Chase & Co.)

Computation of Segregation Requirements and Funds in Segregation for Customers Trading on U.S. Commodity Exchanges pursuant to Section 4d(a)(2) of the Commodity Exchange Act**December 31, 2019**

(in millions)

Segregation requirements

Net ledger balance

Cash	\$	12,199
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Securities (at market)		10,255
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Net unrealized profit/(loss) on open futures contracts traded on a contract market		2,238
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Exchange traded options

Market value of open option contracts purchased on a contract market		1,190
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Market value of open option contracts granted/(sold) on a contract market		(954)
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Net equity		24,928
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Accounts liquidating to a deficit and accounts with debit balances - gross amount		213
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Less: amount offset by customer owned securities		(195)
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Amount required to be segregated		24,946
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Funds on deposit in segregation

Deposited in segregated funds bank accounts

Cash	\$	3,033
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Securities held for particular customers or options customers in lieu of cash (at market)		147
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Margins on deposit with derivatives clearing organizations of contract markets

Cash		960
------	--	-----

Securities representing investments of customers' funds (at market)		11,440
---	--	--------

Securities held for particular customers or option customers in lieu of cash (at market)		8,566
--	--	-------

Net settlement from (to) derivatives clearing organizations of contract markets		251
---	--	-----

Exchange traded options

Value of open long option contracts		1,191
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Value of open short option contracts		(954)
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Segregated funds on hand		1,542
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Total amount in segregation		26,176
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Excess (deficiency) funds in segregation	\$	1,230
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Management Target Amount for Excess funds in segregation	\$	998
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Excess (deficiency) funds in segregation over (under) Management Target Amount Excess	\$	232
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There are no material differences between the amounts presented herein and those reported by J.P. Morgan Securities in its unaudited December 31, 2019 FOCUS Report, as amended, filed on February 28, 2020.

J.P. Morgan Securities LLC and Subsidiaries

(an indirect wholly-owned subsidiary of JPMorgan Chase & Co.)

Computation of Secured Amounts and Funds Held in Separate Accounts for Foreign Futures and Foreign Options Customers pursuant to Commission Regulation 30.7**December 31, 2019**

(in millions)

Foreign futures and foreign options secured amounts

Net ledger balance	
Cash	\$ 2,669
Securities (at market)	1,890
Net unrealized profit/(loss) on open futures contracts traded on a foreign board of trade	206
Exchange traded options	
Market value of open option contracts purchased on a foreign board of trade	57
Market value of open option contracts granted/(sold) on a foreign board of trade	(12)
Net equity	4,810
Accounts liquidating to a deficit and accounts with debit balances - gross amount	116
Less: amount offset by customer owned securities	(115)
Amount required to be segregated	4,811

Funds deposited in separate regulation 30.7 accounts

Cash in banks located in the United States	\$ 1,961
Cash in other banks qualified under Regulation 30.7	93
Securities in safekeeping with banks located in the United States	1,338
Securities in safekeeping with other banks qualified under Regulation 30.7	—
Amounts held by members of foreign boards of trade	
Cash	848
Securities	552
Unrealized gain/(loss) on open futures contracts	205
Value of long option contracts	57
Value of short option contracts	(12)
Total funds in separate section 30.7 accounts	5,042
Excess (deficiency) set Aside Funds for Secured Amount	\$ 231
Management Target Amount for Excess funds in separate section 30.7 accounts	\$ 192
Excess (deficiency) funds in separate 30.7 accounts over (under) Management Target	\$ 39

There are no material differences between the amounts presented herein and those reported by J.P. Morgan Securities in its unaudited December 31, 2019 FOCUS Report, as amended, filed on February 28, 2020.

J.P. Morgan Securities LLC and Subsidiaries

(an indirect wholly-owned subsidiary of JPMorgan Chase & Co.)

Computation of Cleared Swaps Customer Segregation Requirements and Funds in Cleared Swaps Customer Accounts under 4d(f) of the Commodity Exchange Act**December 31, 2019**

(in millions)

Cleared swaps customer requirements

Net ledger balances

Cash	\$	9,789
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Securities (at market)		6,272
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Net unrealized profit/(loss) in open cleared swaps		552
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Cleared swaps options

Market value of open cleared swaps option contracts purchased		—
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Market value of open cleared swaps option contracts granted/(sold)		—
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Net equity		16,613
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Accounts liquidating to a deficit and accounts with debit balances - gross amount		49
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Less: amount offset by customer owned securities		(49)
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Amount required to be segregated for cleared swaps customers		16,613
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Funds in cleared swaps customer segregated accounts

Deposited in cleared swaps customer segregated accounts at banks

Cash	\$	3,379
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Securities held for particular cleared swaps customers in lieu of cash (at market)		17
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Margins on deposit with derivatives clearing organizations in cleared swaps customer segregated accounts

Cash		540
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Securities representing investments of cleared swaps customers' funds (at market)		7,377
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Securities held for particular cleared swaps customers in lieu of cash (at market)		6,255
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Net settlement from (to) derivatives clearing organizations		16
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Cleared swaps options

Value of open cleared swaps long option contracts		—
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Value of open cleared swaps short option contracts		—
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Total amount in cleared swaps customer segregation		17,584
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Excess (deficiency) funds in cleared swaps customer segregation	\$	971
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Management Target Amount for Excess funds in cleared swaps segregated accounts	\$	581
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Excess (deficiency) funds in cleared swaps customer segregated accounts over (under) Management Target Excess	\$	390
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There are no material differences between the amounts presented herein and those reported by J.P. Morgan Securities in its unaudited December 31, 2019 FOCUS Report, as amended, filed on February 28, 2020.