

**JPMORGAN CHASE BANK,  
NATIONAL ASSOCIATION**

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

**CONSOLIDATED FINANCIAL STATEMENTS**  
For the three years ended December 31, 2019

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**FOR THE THREE YEARS ENDED DECEMBER 31, 2019**

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## Report of Independent Auditors

To the Board of Directors and Shareholder of JPMorgan Chase Bank, National Association

We have audited the accompanying consolidated financial statements of JPMorgan Chase Bank, National Association and its subsidiaries, which comprise the consolidated balance sheets as of December 31, 2019 and 2018, and the related consolidated statements of income, comprehensive income, changes in stockholder's equity and cash flows for each of the three years in the period ended December 31, 2019.

### ***Management's Responsibility for the Consolidated Financial Statements***

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

### ***Auditors' Responsibility***

Our responsibility is to express an opinion on the consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the Company's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### ***Opinion***

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of JPMorgan Chase Bank, National Association and its subsidiaries as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in accordance with accounting principles generally accepted in the United States of America.

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

February 25, 2020

# Consolidated statements of income

JPMorgan Chase Bank, National Association  
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2019	2018	2017
<b>Revenue</b>			
Investment banking fees	\$ 3,217	\$ 3,368	\$ 3,419
Principal transactions	11,564	11,814	9,883
Lending- and deposit-related fees	6,368	6,057	5,941
Asset management, administration and commissions	11,977	11,029	10,358
Investment securities gains/(losses)	253	(395)	(73)
Mortgage fees and related income	2,036	1,253	1,616
Card income	5,304	4,989	4,433
Other income	6,206	5,612	4,341
<b>Noninterest revenue</b>	<b>46,925</b>	<b>43,727</b>	<b>39,918</b>
Interest income <sup>(a)</sup>	75,666	68,781	58,820
Interest expense <sup>(a)</sup>	17,008	12,624	7,846
<b>Net interest income</b>	<b>58,658</b>	<b>56,157</b>	<b>50,974</b>
<b>Total net revenue</b>	<b>105,583</b>	<b>99,884</b>	<b>90,892</b>
Provision for credit losses	5,593	4,872	5,298
<b>Noninterest expense</b>			
Compensation expense	28,257	26,541	24,933
Occupancy expense	4,132	3,801	3,504
Technology, communications and equipment expense	9,400	8,404	7,328
Professional and outside services	5,917	5,839	5,420
Marketing	3,421	3,145	2,793
Other expense	9,104	9,904	9,448
<b>Total noninterest expense</b>	<b>60,231</b>	<b>57,634</b>	<b>53,426</b>
<b>Income before income tax expense</b>	<b>39,759</b>	<b>37,378</b>	<b>32,168</b>
Income tax expense	8,420	8,425	12,528
<b>Net income</b>	<b>\$ 31,339</b>	<b>\$ 28,953</b>	<b>\$ 19,640</b>

(a) During the first half of 2019, the Bank implemented certain presentation changes that impacted interest income and interest expense, but had no effect on net interest income. These changes were applied retrospectively and, accordingly, prior period amounts were revised to conform with the current presentation. Refer to Note 8 for additional information.

The Notes to Consolidated Financial Statements are an integral part of these statements.

## Consolidated statements of comprehensive income

JPMorgan Chase Bank, National Association  
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2019	2018	2017
<b>Net income</b>	\$ 31,339	\$ 28,953	\$ 19,640
<b>Other comprehensive income/(loss), after-tax</b>			
Unrealized gains/(losses) on investment securities	2,869	(1,806)	687
Translation adjustments, net of hedges	(4)	57	(309)
Fair value hedges	–	1	NA
Cash flow hedges	167	(198)	176
Defined benefit pension and OPEB plans	656	(1,969)	11
DVA on fair value option elected liabilities	(319)	321	(55)
<b>Total other comprehensive income/(loss), after-tax</b>	<b>3,369</b>	<b>(3,594)</b>	<b>510</b>
<b>Comprehensive income</b>	\$ <b>34,708</b>	\$ 25,359	\$ 20,150

The Notes to Consolidated Financial Statements are an integral part of these statements.

## Consolidated balance sheets

JPMorgan Chase Bank, National Association  
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

December 31, (in millions, except share data)	2019	2018
<b>Assets</b>		
Cash and due from banks	\$ 21,164	\$ 21,611
Deposits with banks	240,953	255,135
Federal funds sold and securities purchased under resale agreements (included \$5,682 and \$4,370 at fair value)	211,397	275,476
Securities borrowed (included \$6,237 and \$5,105 at fair value)	38,776	45,335
Trading assets (included assets pledged of \$52,148 and \$44,189)	263,504	264,533
Investment securities (included \$349,663 and \$228,712 at fair value and assets pledged of \$16,139 and \$17,778)	397,203	260,146
Loans (included \$7,104 and \$3,151 at fair value)	958,215	983,133
Allowance for loan losses	(13,106)	(13,425)
<b>Loans, net of allowance for loan losses</b>	<b>945,109</b>	<b>969,708</b>
Accrued interest and accounts receivable	54,232	49,966
Premises and equipment	25,258	14,700
Goodwill, MSRs and other intangible assets	44,986	45,970
Other assets (included \$6,480 and \$5,708 at fair value and assets pledged of \$1,374 and \$1,514)	95,064	88,900
<b>Total assets<sup>(a)</sup></b>	<b>\$ 2,337,646</b>	<b>\$ 2,291,480</b>
<b>Liabilities</b>		
Deposits (included \$28,662 and \$23,371 at fair value)	\$ 1,650,488	\$ 1,557,411
Federal funds purchased and securities loaned or sold under repurchase agreements (included \$5,501 and \$5,215 at fair value)	86,549	107,809
Short-term borrowings (included \$3,865 and \$4,594 at fair value)	8,521	21,846
Trading liabilities	87,643	113,887
Accounts payable and other liabilities (included \$6,483 and \$5,757 at fair value)	118,815	109,152
Beneficial interests issued by consolidated variable interest entities	17,814	20,310
Long-term debt (included \$40,271 and \$26,553 at fair value)	121,719	110,236
<b>Total liabilities<sup>(a)</sup></b>	<b>2,091,549</b>	<b>2,040,651</b>
Commitments and contingencies (refer to Notes 26, 27 and 28)		
<b>Stockholder's equity</b>		
Preferred stock (\$1 par value; authorized 15,000,000 shares; issued 0 shares)	—	—
Common stock (\$12 par value; authorized 200,000,000 shares; issued 168,971,750 shares)	2,028	2,028
Additional paid-in capital	110,297	123,792
Retained earnings	132,016	126,622
Accumulated other comprehensive income/(loss)	1,756	(1,613)
<b>Total stockholder's equity</b>	<b>246,097</b>	<b>250,829</b>
<b>Total liabilities and stockholder's equity</b>	<b>\$ 2,337,646</b>	<b>\$ 2,291,480</b>

(a) The following table presents information on assets and liabilities related to VIEs that are consolidated by the Bank at December 31, 2019 and 2018. 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 Bank. The assets and liabilities in the table below include third-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation. Refer to Note 15 for a further discussion.

December 31, (in millions)	2019	2018
<b>Assets</b>		
Trading assets	\$ 2,183	\$ 1,910
Loans	42,931	59,456
All other assets	713	835
<b>Total assets</b>	<b>\$ 45,827</b>	<b>\$ 62,201</b>
<b>Liabilities</b>		
Beneficial interests issued by consolidated variable interest entities	\$ 17,814	\$ 20,310
All other liabilities	371	232
<b>Total liabilities</b>	<b>\$ 18,185</b>	<b>\$ 20,542</b>

The Notes to Consolidated Financial Statements are an integral part of these statements.

## Consolidated statements of changes in stockholder's equity

JPMorgan Chase Bank, National Association  
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2019	2018	2017
<b>Common stock</b>			
Balance at January 1 and December 31	\$ 2,028	\$ 2,028	\$ 2,028
<b>Additional paid-in capital</b>			
Balance at January 1	123,792	118,898	114,740
Cash capital contribution from JPMorgan Chase & Co.	–	1,094	4,000
Return of capital to JPMorgan Chase & Co.	(13,500)	–	–
Adjustments to capital due to transactions with JPMorgan Chase & Co.	5	3,800	158
<b>Balance at December 31</b>	<b>110,297</b>	<b>123,792</b>	<b>118,898</b>
<b>Retained earnings</b>			
Balance at January 1	126,622	123,849	117,209
Cumulative effect of change in accounting principles	55	(680)	–
Net income	31,339	28,953	19,640
Cash dividends paid to JPMorgan Chase & Co.	(26,000)	(25,500)	(13,000)
<b>Balance at December 31</b>	<b>132,016</b>	<b>126,622</b>	<b>123,849</b>
<b>Accumulated other comprehensive income</b>			
Balance at January 1	(1,613)	1,375	865
Cumulative effect of change in accounting principles	–	606	–
Adjustments to AOCI due to transactions with JPMorgan Chase & Co.	–	(1,623)	–
Other comprehensive income/(loss), after-tax	3,369	(1,971)	510
<b>Balance at December 31</b>	<b>1,756</b>	<b>(1,613)</b>	<b>1,375</b>
<b>Total stockholder's equity</b>	<b>\$ 246,097</b>	<b>\$ 250,829</b>	<b>\$ 246,150</b>

The Notes to Consolidated Financial Statements are an integral part of these statements.

# Consolidated statements of cash flows

JPMorgan Chase Bank, National Association  
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2019	2018	2017
<b>Operating activities</b>			
Net income	\$ 31,339	\$ 28,953	\$ 19,640
Adjustments to reconcile net income to net cash provided by/(used in) operating activities:			
Provision for credit losses	5,593	4,872	5,298
Depreciation and amortization	8,102	7,541	6,000
Deferred tax expense/(benefit)	1,021	1,600	(52)
Other	(253)	395	73
Originations and purchases of loans held-for-sale	(66,375)	(101,476)	(94,628)
Proceeds from sales, securitizations and paydowns of loans held-for-sale	74,577	92,788	93,264
Net change in:			
Trading assets	(12,589)	(17,348)	9,926
Securities borrowed	6,691	(6,304)	(6,462)
Accrued interest and accounts receivable	(4,416)	(1,450)	(7,702)
Other assets	(26,837)	(8,942)	(681)
Trading liabilities	(7,933)	14,521	(28,093)
Accounts payable and other liabilities	(4,076)	10,888	(4,289)
Other operating adjustments	6,607	1,094	4,346
<b>Net cash provided by/(used in) operating activities</b>	<b>11,451</b>	<b>27,132</b>	<b>(3,360)</b>
<b>Investing activities</b>			
Net change in:			
Federal funds sold and securities purchased under resale agreements	64,083	(120,260)	17,315
Held-to-maturity securities:			
Proceeds from paydowns and maturities	3,423	2,945	4,563
Purchases	(13,427)	(9,368)	(2,349)
Available-for-sale securities:			
Proceeds from paydowns and maturities	51,795	36,912	55,583
Proceeds from sales	69,953	45,953	89,418
Purchases	(242,149)	(95,090)	(105,134)
Proceeds from sales and securitizations of loans held-for-investment	62,070	29,826	15,791
Other changes in loans, net	(53,553)	(81,238)	(62,345)
All other investing activities, net	(3,249)	(1,525)	308
<b>Net cash provided by/(used in) investing activities</b>	<b>(61,054)</b>	<b>(191,845)</b>	<b>13,150</b>
<b>Financing activities</b>			
Net change in:			
Deposits	103,887	24,191	41,578
Federal funds purchased and securities loaned or sold under repurchase agreements	(21,364)	13,336	19,657
Short-term borrowings	(13,964)	12,693	(4,412)
Beneficial interests issued by consolidated variable interest entities	4,223	1,680	(987)
Proceeds from long-term borrowings	45,147	37,441	22,098
Payments of long-term borrowings	(43,370)	(51,179)	(48,770)
Cash capital contribution from JPMorgan Chase & Co.	–	1,094	4,000
Return of capital to JPMorgan Chase & Co.	(13,500)	–	–
Dividends paid to JPMorgan Chase & Co.	(26,000)	(25,500)	(13,000)
All other financing activities, net	123	613	1,698
<b>Net cash provided by financing activities</b>	<b>35,182</b>	<b>14,369</b>	<b>21,862</b>
Effect of exchange rate changes on cash and due from banks and deposits with banks	(208)	(2,807)	8,045
Net increase/(decrease) in cash and due from banks and deposits with banks	(14,629)	(153,151)	39,697
Cash and due from banks and deposits with banks at the beginning of the period	276,746	429,897	390,200
<b>Cash and due from banks and deposits with banks at the end of the period</b>	<b>\$ 262,117</b>	<b>\$ 276,746</b>	<b>\$ 429,897</b>
Cash interest paid	\$ 17,004	\$ 11,565	\$ 7,745
Cash income taxes paid, net <sup>(a)</sup>	6,200	3,183	5,589

(a) Includes \$4.7 billion, \$1.7 billion and \$3.4 billion paid to JPMorgan Chase & Co. in 2019, 2018 and 2017, respectively. Refer to Note 23 for discussion of income taxes.

The Notes to Consolidated Financial Statements are an integral part of these statements.

# Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

## Note 1 – Overview and basis of presentation

JPMorgan Chase Bank, National Association, (“JPMorgan Chase Bank, N.A.” or the “Bank”), is a wholly-owned bank 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. The Bank is a national banking association that is chartered by the Office of the Comptroller of the Currency (“OCC”), a bureau of the U.S. Department of the Treasury. The Bank’s main office is located in Columbus, Ohio, and it has U.S. branches in 38 states and Washington, D.C. as of December 31, 2019. The Bank operates nationally as well as through non-U.S. bank branches and subsidiaries, and representative offices. The Bank either directly or through such branches, subsidiaries and offices offers a wide range of banking services to its U.S. and non-U.S. customers including investment banking, financial services for consumers and small business, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Bank serves millions of customers in the U.S. and many of the world’s most prominent corporate, institutional and government clients. The Bank’s principal operating subsidiary in the United Kingdom (“U.K.”) is J.P. Morgan Securities plc.

The JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of management of JPMorgan Chase Bank, N.A. The JPMorgan Chase Bank, N.A. Board of Directors accomplishes this function acting directly and through the principal standing committees of JPMorgan Chase’s Board of Directors. Risk and control oversight is primarily the responsibility of the Risk Committee and the Audit Committee, respectively, and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee. Each committee of JPMorgan Chase’s Board of Directors oversees reputational risks and conduct risks within its scope of responsibility.

The accounting and financial reporting policies of the Bank 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.

Certain amounts reported in prior periods have been reclassified to conform with the current presentation.

### **Internal merger of legal entities under common control**

*Merger with Chase Bank USA, National Association (“Chase Bank USA, N.A.”).* On May 18, 2019, JPMorgan Chase completed the merger of Chase Bank USA, N.A. with and into JPMorgan Chase Bank, N.A., with JPMorgan Chase Bank, N.A. as the surviving bank (the “Merger”). Chase Bank USA, N.A. was formerly a wholly-owned banking subsidiary of JPMorgan Chase and its principal credit card-

issuing bank. JPMorgan Chase Bank, N.A. issued 20.2 million shares of its common stock to JPMorgan Chase in exchange for the net assets of Chase Bank USA, N.A. The Merger is part of JPMorgan Chase’s legal entity simplification strategy.

In accordance with U.S. GAAP, the Merger was accounted for as a transaction between legal entities under common control and was considered a change in the reporting entity. Therefore, the net assets of Chase Bank USA, N.A. were merged at their carrying value. The impacts of the Merger are included in the Consolidated Financial Statements, retrospectively, for all periods presented.

### **Return of Capital**

In connection with its regulatory capital management strategy, the Bank distributed \$13.5 billion to JPMorgan Chase as a return of capital. Refer to Note 25 for further discussion of regulatory capital requirements.

### **Supervision and regulation**

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

In the U.S., the Bank is supervised and regulated by the OCC and, with respect to certain matters, by the Federal Deposit Insurance Corporation (the “FDIC”). J.P. Morgan Securities plc is regulated by the U.K. Prudential Regulation Authority (the “PRA”) and the U.K. Financial Conduct Authority (the “FCA”).

*Restrictions on transactions with affiliates.* The Bank and its subsidiaries are subject to restrictions imposed by federal law on extensions of credit to, investments in stock or securities of, and derivatives, securities lending and certain other transactions with, JPMorgan Chase & Co. and certain other affiliates. These restrictions prevent JPMorgan Chase & Co. and other affiliates from borrowing from such subsidiaries unless the loans are secured in specified amounts and comply with certain other requirements.

Refer to “Supervision and regulation” in the Annual Report on Form 10-K of JPMorgan Chase for the year ended December 31, 2019, filed with the U.S. Securities and Exchange Commission on February 25, 2020 for additional information concerning the supervision and regulation of JPMorgan Chase Bank, N.A.

### **Consolidation**

The Consolidated Financial Statements include the accounts of the Bank and other entities in which the Bank has a controlling financial interest. All material intercompany balances and transactions have been eliminated.

Assets held for clients in an agency or fiduciary capacity by the Bank are not assets of the Bank and are not included on the Consolidated balance sheets.

## Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

The Bank determines whether it has a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity.

### *Voting interest entities*

Voting interest entities are entities that have sufficient equity and provide the equity investors voting rights that enable them to make significant decisions relating to the entity's operations. For these types of entities, the Bank's determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which the Bank has a controlling financial interest, through ownership of the majority of the entities' voting equity interests, or through other contractual rights that give the Bank control, are consolidated by the Bank.

Investments in companies in which the Bank 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 Bank to recognize its proportionate share of the entity's net earnings), or (ii) at fair value if the fair value option was elected. These investments are generally included in other assets, with income or loss included in noninterest revenue.

Certain Bank-sponsored asset management funds are structured as limited partnerships or limited liability companies. The Bank does not generally consolidate these funds as the Bank is not the general partner or managing member and therefore does not have a controlling financial interest.

### *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 Bank has the power to direct the activities of a VIE that most significantly impact the VIE's economic performance, the Bank considers all the facts and circumstances, including its role in establishing the VIE and its ongoing rights and responsibilities. This assessment includes, first, identifying the activities that most significantly impact the VIE's economic performance; and second, identifying which party, if any, has power over those activities. In general, the parties that make the most significant decisions affecting the VIE (such as asset managers, collateral managers, servicers, or owners of call options or liquidation rights over the VIE's assets) or have the right to unilaterally remove those decision-makers are deemed to have the power to direct the activities of a VIE.

To assess whether the Bank has the obligation to absorb losses of the VIE or the right to receive benefits from the VIE that could potentially be significant to the VIE, the Bank considers all of its economic interests, including debt and equity investments, servicing fees, and derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that the Bank apply judgment in determining whether these interests, in the aggregate, are considered potentially significant to the VIE. Factors considered in assessing significance include: the design of the VIE, including its capitalization structure; subordination of interests; payment priority; relative share of interests held across various classes within the VIE's capital structure; and the reasons why the interests are held by the Bank.

The Bank performs on-going reassessments of: (1) whether entities previously evaluated under the majority voting-interest framework have become VIEs, based on certain events, and are therefore subject to the VIE consolidation framework; and (2) whether changes in the facts and circumstances regarding the Bank's involvement with a VIE cause the Bank's consolidation conclusion to change.

Refer to Note 15 for further discussion of the Bank's VIEs.

## **Revenue recognition**

### *Interest income*

The Bank recognizes interest income on loans, debt securities, and other debt instruments, generally on a level-yield basis, based on the underlying contractual rate. Refer to Note 8 for further discussion of interest income.

### *Revenue from contracts with customers*

The Bank recognizes noninterest revenue from certain contracts with customers, in investment banking fees, deposit-related fees, asset management administration and commissions, and components of card income, when the Bank's related performance obligations are satisfied. Refer to Note 7 for further discussion of the Bank's revenue from contracts with customers.

### *Principal transactions revenue*

The Bank carries a portion of its assets and liabilities at fair value. Changes in fair value are reported primarily in principal transactions revenue. Refer to Notes 3 and 4 for further discussion of fair value measurement. Refer to Note 7 for further discussion of principal transactions revenue.

### **Use of estimates in the preparation of consolidated financial statements**

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

### **Foreign currency translation**

The Bank revalues assets, liabilities, revenue and expense denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

Gains and losses relating to translating functional currency financial statements for U.S. reporting are included in the Consolidated statements of comprehensive income. Gains and losses relating to nonfunctional currency transactions, including non-U.S. operations where the functional currency is the U.S. dollar, are reported in the Consolidated statements of income.

### **Offsetting assets and liabilities**

U.S. GAAP permits entities to present derivative receivables and derivative payables with the same counterparty and the related cash collateral receivables and payables on a net basis on the Consolidated balance sheets when a legally enforceable master netting agreement exists. U.S. GAAP also permits securities sold and purchased under repurchase agreements and securities borrowed or loaned under securities loan agreements to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. The Bank has elected to net such balances when the specified conditions are met.

The Bank uses master netting agreements with third parties and affiliates to mitigate counterparty credit risk in certain transactions, including derivative contracts, resale, repurchase, securities borrowed and securities loaned agreements. A master netting agreement is a single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due). Upon the exercise of derivatives termination rights by the non-defaulting party (i) all transactions are terminated, (ii) all transactions are valued and the positive values of “in the money” transactions are netted against the negative values of “out of the money” transactions and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount. Upon exercise of default rights under

repurchase agreements and securities loan agreements in general (i) all transactions are terminated and accelerated, (ii) all values of securities or cash held or to be delivered are calculated, and all such sums are netted against each other and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount.

Typical master netting agreements for these types of transactions also often contain a collateral/margin agreement that provides for a security interest in, or title transfer of, securities or cash collateral/margin to the party that has the right to demand margin (the “demanding party”). The collateral/margin agreement typically requires a party to transfer collateral/margin to the demanding party with a value equal to the amount of the margin deficit on a net basis across all transactions governed by the master netting agreement, less any threshold. The collateral/margin agreement grants to the demanding party, upon default by the counterparty, the right to set-off any amounts payable by the counterparty against any posted collateral or the cash equivalent of any posted collateral/margin. It also grants to the demanding party the right to liquidate collateral/margin and to apply the proceeds to an amount payable by the counterparty.

Refer to Note 6 for further discussion of the Bank’s derivative instruments. Refer to Note 12 for further discussion of the Bank’s securities financing agreements.

### **Statements of cash flows**

For the Bank’s Consolidated statements of cash flows, cash is defined as those amounts included in cash and due from banks and deposits with banks.

### **Accounting standards adopted January 1, 2018**

Effective January 1, 2018, the Bank adopted several accounting standards resulting in a net decrease of \$680 million to retained earnings and a net increase of \$606 million to AOCI. Certain of these standards were adopted retrospectively and, accordingly, prior period amounts were revised. The adoption of the recognition and measurement guidance resulted in \$456 million of fair value gains in the first half of 2018, recorded in total net revenue, on certain equity investments that were previously held at cost.

## Notes to consolidated financial statements

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### Significant accounting policies

The following table identifies the Bank's other significant accounting policies and the Note and page where a detailed description of each policy can be found.

Fair value measurement	Note 3	Page 13
Fair value option	Note 4	Page 30
Derivative instruments	Note 6	Page 35
Noninterest revenue and noninterest expense	Note 7	page 49
Interest income and Interest expense	Note 8	Page 52
Pension and other postretirement employee benefit plans	Note 9	page 52
Employee share-based incentives	Note 10	page 58
Investment securities	Note 11	Page 60
Securities financing activities	Note 12	Page 66
Loans	Note 13	page 69
Allowance for credit losses	Note 14	page 89
Variable interest entities	Note 15	Page 94
Goodwill and Mortgage servicing rights	Note 16	page 102
Premises and equipment	Note 17	page 104
Leases	Note 19	page 105
Long-term debt	Note 20	Page 107
Related party transactions	Note 21	Page 108
Income taxes	Note 23	Page 112
Off-balance sheet lending-related financial instruments, guarantees and other commitments	Note 26	Page 118
Litigation	Note 28	page 125

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### Note 2 – ACCOUNTING AND REPORTING DEVELOPMENTS

#### Financial Accounting Standards Board (“FASB”) Standards Adopted January 1, 2019

Standard	Summary of guidance	Effects on financial statements
Leases <i>Issued February 2016</i>	<ul style="list-style-type: none"> <li>Requires lessees to recognize all leases longer than twelve months on the Consolidated balance sheets as a lease liability with a corresponding right-of-use asset.</li> <li>Requires lessees and lessors to classify most leases using principles similar to existing lease accounting, but eliminates the “bright line” classification tests.</li> <li>Expands qualitative and quantitative leasing disclosures.</li> </ul>	<ul style="list-style-type: none"> <li>Adopted January 1, 2019.</li> <li>The Bank 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 Bank elected the modified retrospective transition method, through a cumulative-effect adjustment to retained earnings without revising prior periods.</li> <li>Refer to Note 19 for further information.</li> </ul>

#### FASB Standards Issued but not adopted as of December 31, 2019

Standard	Summary of guidance	Effects on financial statements																																																
Financial Instruments - Credit Losses (“CECL”) <i>Issued June 2016</i>	<ul style="list-style-type: none"> <li>Establishes a single allowance framework for all financial assets carried at amortized cost and certain off-balance sheet credit 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.</li> <li>Eliminates existing guidance for PCI loans, and requires recognition of the nonaccretable difference as an increase to the allowance for expected credit losses on financial assets purchased with more than insignificant credit deterioration since origination, with a corresponding increase in the recorded investment of the related loans.</li> <li>Requires inclusion of expected recoveries, limited to the cumulative amount of prior write-offs, when estimating the allowance for credit losses for in scope financial assets (including collateral dependent assets).</li> <li>Amends existing impairment guidance for AFS securities to incorporate an allowance, which will allow for reversals of credit impairments in the event that the credit of an issuer improves.</li> <li>Requires a cumulative-effect adjustment to retained earnings as of the beginning of the reporting period of adoption.</li> </ul>	<ul style="list-style-type: none"> <li>Adopted January 1, 2020.</li> <li>The following table presents the impacts to the allowance for credit losses and retained earnings upon adoption of this guidance on January 1, 2020:</li> </ul> <table border="1"> <thead> <tr> <th>(in billions)</th> <th>December 31, 2019</th> <th>CECL adoption impact</th> <th>January 1, 2020</th> </tr> </thead> <tbody> <tr> <td colspan="4"><b>Allowance for credit losses</b></td> </tr> <tr> <td>Consumer, excluding credit card</td> <td>\$ 3.2</td> <td>\$ 0.2</td> <td>\$ 3.4</td> </tr> <tr> <td>Credit card</td> <td>5.7</td> <td>5.5</td> <td>11.2</td> </tr> <tr> <td>Wholesale</td> <td>5.4</td> <td>(1.4)</td> <td>4.0</td> </tr> <tr> <td>Total allowance for credit losses</td> <td>\$ 14.3</td> <td>\$ 4.3</td> <td>\$ 18.6</td> </tr> <tr> <td colspan="4"><b>Retained earnings</b></td> </tr> <tr> <td>Allowance increase</td> <td></td> <td>\$ 4.3</td> <td></td> </tr> <tr> <td>Balance sheet reclassification<sup>(a)</sup></td> <td></td> <td>(0.8)</td> <td></td> </tr> <tr> <td>Total pre-tax impact</td> <td></td> <td>3.5</td> <td></td> </tr> <tr> <td>Tax effect</td> <td></td> <td>(0.8)</td> <td></td> </tr> <tr> <td>Decrease to retained earnings</td> <td></td> <td>\$ 2.7</td> <td></td> </tr> </tbody> </table> <p>(a) Represents the recognition of the nonaccretable difference on purchased credit deteriorated assets and the Bank’s election to recognize the reserve for uncollectible accrued interest on credit card loans in the allowance, both of which resulted in a corresponding increase to loans.</p> <ul style="list-style-type: none"> <li>The Bank estimates losses over a two-year forecast period using the weighted-average of a range of macroeconomic scenarios (established on a JPMorgan Chase Firmwide basis), and then reverts to longer term historical loss experience to estimate losses over more extended periods.</li> <li>As permitted by the guidance, the Bank 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 Bank’s cumulative-effect adjustment.</li> </ul>	(in billions)	December 31, 2019	CECL adoption impact	January 1, 2020	<b>Allowance for credit losses</b>				Consumer, excluding credit card	\$ 3.2	\$ 0.2	\$ 3.4	Credit card	5.7	5.5	11.2	Wholesale	5.4	(1.4)	4.0	Total allowance for credit losses	\$ 14.3	\$ 4.3	\$ 18.6	<b>Retained earnings</b>				Allowance increase		\$ 4.3		Balance sheet reclassification <sup>(a)</sup>		(0.8)		Total pre-tax impact		3.5		Tax effect		(0.8)		Decrease to retained earnings		\$ 2.7	
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### FASB Standards Issued but not adopted as of December 31, 2019 (continued)

Standard	Summary of guidance	Effects on financial statements
Goodwill <i>Issued January 2017</i>	<ul style="list-style-type: none"><li>Requires recognition of an impairment loss when the estimated fair value of a reporting unit falls below its carrying value.</li><li>Eliminates the requirement that an impairment loss be recognized only if the estimated implied fair value of the goodwill is below its carrying value.</li></ul>	<ul style="list-style-type: none"><li>Adopted January 1, 2020.</li><li>No impact is expected upon adoption as the guidance is to be applied prospectively.</li></ul>

### Note 3 – Fair value measurement

The Bank carries a portion of its assets and liabilities at fair value. These assets and liabilities are predominantly carried at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on the Bank's Consolidated balance sheets). Certain assets, liabilities and unfunded lending-related commitments are measured at fair value on a nonrecurring basis; that is, they are not measured at fair value on an ongoing basis but are subject to fair value adjustments only in certain circumstances (for example, when there is evidence of impairment).

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is based on quoted market prices or inputs, where available. If prices or quotes are not available, fair value is based on valuation models and other valuation techniques that consider relevant transaction characteristics (such as maturity) and use, as inputs, observable or unobservable market parameters, including yield curves, interest rates, volatilities, prices (such as commodity, equity or debt prices), correlations, foreign exchange rates and credit curves. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value, as described below.

The level of precision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Bank 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 Bank's businesses and portfolios.

The Bank 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 Bank could result in the Bank deriving a different estimate of fair value at the reporting date.

#### **Valuation process**

Risk-taking functions are responsible for providing fair value estimates for assets and liabilities carried on the Consolidated balance sheets at fair value. 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 Bank's positions are recorded at fair value. The 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 Firmwide VGF is chaired by the Firmwide head of the VCG (under the direction of JPMorgan Chase's Controller).

#### *Price verification process*

The VCG verifies fair value estimates provided by the risk-taking functions by leveraging independently derived prices, valuation inputs and other market data, where available. Where independent prices or inputs are not available, the VCG performs additional review to ensure the reasonableness of the estimates. The additional review may include evaluating the limited market activity including client unwinds, benchmarking valuation inputs to those used for similar instruments, decomposing the valuation of structured instruments into individual components, comparing expected to actual cash flows, reviewing profit and loss trends, and reviewing trends in collateral valuation. There are also additional levels of management review for more significant or complex positions.

The VCG determines any valuation adjustments that may be required to the estimates provided by the risk-taking functions. No adjustments to quoted prices are applied for instruments classified within level 1 of the fair value hierarchy (refer to the discussion below for further information on the fair value hierarchy). For other positions, judgment is required to assess the need for valuation adjustments to appropriately reflect liquidity considerations, unobservable parameters, and, for certain portfolios that meet specified criteria, the size of the net open risk position. The determination of such adjustments follows a consistent framework across the Bank:

- 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 Bank 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.

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- Uncertainty adjustments related to unobservable 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 Bank also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality (credit valuation adjustments (“CVA”)), the Bank’s own creditworthiness (debit valuation adjustments (“DVA”)) and the impact of funding (funding valuation adjustments (“FVA”)), using a consistent framework across the Bank.

### ***Valuation model review and approval***

If prices or quotes are not available for an instrument or a similar instrument, fair value is generally determined using valuation models that consider relevant transaction terms such as maturity and use as inputs market-based or independently sourced parameters. Where this is the case the price verification process described above is applied to the inputs in those models.

Under the Bank’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 the

Bank’s policy to allow a model to be used prior to review or approval. The 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.

### **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 table describes the valuation methodologies generally used by the Bank to measure its 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"> <li>• Derivative features: refer to the discussion of derivatives below for further information.</li> <li>• Market rates for the respective maturity</li> <li>• Collateral characteristics</li> </ul>	Predominantly level 2
<b>Loans and lending-related commitments - wholesale</b>		
Loans carried at fair value (e.g. trading loans and non-trading loans) and associated lending-related commitments	<p>Where observable market data is available, valuations are based on:</p> <ul style="list-style-type: none"> <li>• Observed market prices (circumstances are infrequent)</li> <li>• Relevant broker quotes</li> <li>• Observed market prices for similar instruments</li> </ul> <p>Where observable market data is unavailable or limited, valuations are based on discounted cash flows, which consider the following:</p> <ul style="list-style-type: none"> <li>• Credit spreads derived from the cost of credit default swaps (“CDS”); or benchmark credit curves developed by the Bank, by industry and credit rating</li> <li>• Prepayment speed</li> <li>• Collateral characteristics</li> </ul>	Level 2 or 3
<b>Loans - consumer</b>		
Trading loans - conforming residential mortgage loans expected to be sold	<p>Fair value is based on observable prices for mortgage-backed securities (“MBS”) with similar collateral and incorporates adjustments to these prices to account for differences between the securities and the value of the underlying loans, which include credit characteristics, portfolio composition, and liquidity.</p>	Predominantly level 2
Investment and trading securities	<p>Quoted market prices</p> <p>In the absence of quoted market prices, securities are valued based on:</p> <ul style="list-style-type: none"> <li>• Observable market prices for similar securities</li> <li>• Relevant broker quotes</li> <li>• Discounted cash flows</li> </ul> <p>In addition, the following inputs to discounted cash flows are used for the following products:</p> <p><i>Mortgage- and asset-backed securities (“ABS”) specific inputs:</i></p> <ul style="list-style-type: none"> <li>• Collateral characteristics</li> <li>• Deal-specific payment and loss allocations</li> <li>• Current market assumptions related to yield, prepayment speed, conditional default rates and loss severity</li> </ul> <p><i>Collateralized loan obligations (“CLOs”) specific inputs:</i></p> <ul style="list-style-type: none"> <li>• Collateral characteristics</li> <li>• Deal-specific payment and loss allocations</li> <li>• Expected prepayment speed, conditional default rates, loss severity</li> <li>• Credit spreads</li> <li>• Credit rating data</li> </ul>	<p>Level 1</p> <p>Level 2 or 3</p>
Physical commodities	Valued using observable market prices or data.	Level 1 or 2

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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 that may use observable or unobservable valuation inputs as well as considering the contractual terms.</p> <p>The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, interest rate yield curves, foreign exchange rates, volatilities, correlations, CDS spreads and recovery rates. Additionally, the credit quality of the counterparty and of the Bank as well as market funding levels may also 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"> <li>• CDS spreads and recovery rates</li> <li>• Credit correlation between the underlying debt instruments</li> </ul> <p>Equity option specific inputs include:</p> <ul style="list-style-type: none"> <li>• Forward equity price</li> <li>• Equity volatility</li> <li>• Equity correlation</li> <li>• Equity-FX correlation</li> <li>• Equity-IR correlation</li> </ul> <p>Interest rate and FX exotic options specific inputs include:</p> <ul style="list-style-type: none"> <li>• Interest rate volatility</li> <li>• Interest rate spread volatility</li> <li>• Interest rate correlation</li> <li>• Foreign exchange correlation</li> <li>• Interest rate-FX correlation</li> </ul> <p>Commodity derivatives specific inputs include:</p> <ul style="list-style-type: none"> <li>• Commodity volatility</li> <li>• Forward commodity price</li> </ul> <p>Additionally, adjustments are made to reflect counterparty credit quality (CVA) and the impact of funding (FVA).</p>	Level 2 or 3
Mortgage servicing rights (“MSRs”)	Refer to Mortgage servicing rights in Note 16.	Level 3
Fund investments (e.g., mutual/collective investment funds, private equity funds, hedge funds, and real estate funds)	Net asset value (“NAV”)	Level 1
	<ul style="list-style-type: none"> <li>• NAV is supported by the ability to redeem and purchase at the NAV level.</li> <li>• Adjustments to the NAV as required, for restrictions on redemption (e.g., lock-up periods or withdrawal limitations) or where observable activity is limited.</li> </ul>	Level 2 or 3 <sup>(a)</sup>
Beneficial interests issued by consolidated VIEs	<p>Valued using observable market information, where available.</p> <p>In the absence of observable market information, valuations are based on the fair value of the underlying assets held by the VIE.</p>	Level 2 or 3
Structured notes (included in deposits, short-term borrowings and long-term debt)	<ul style="list-style-type: none"> <li>• Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note.</li> <li>• The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion above regarding derivatives valuation. Adjustments are then made to this base valuation to reflect the Bank’s own credit risk (DVA).</li> </ul>	Level 2 or 3

(a) Excludes certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient.

The following table presents the assets and liabilities reported at fair value as of December 31, 2019 and 2018, by major product category and fair value hierarchy.

### Assets and liabilities measured at fair value on a recurring basis

December 31, 2019 (in millions)	Fair value hierarchy			Derivative netting adjustments <sup>(e)</sup>	Total fair value
	Level 1	Level 2	Level 3		
Federal funds sold and securities purchased under resale agreements	\$ —	\$ 5,682	\$ —	\$ —	\$ 5,682
Securities borrowed	—	6,237	—	—	6,237
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies <sup>(a)</sup>	—	4,929	708	—	5,637
Residential - nonagency	—	971	14	—	985
Commercial - nonagency	—	204	1	—	205
<b>Total mortgage-backed securities</b>	—	6,104	723	—	6,827
U.S. Treasury, GSEs and government agencies <sup>(a)</sup>	19,241	1,105	—	—	20,346
Obligations of U.S. states and municipalities	—	4,021	6	—	4,027
Certificates of deposit, bankers' acceptances and commercial paper	—	221	—	—	221
Non-U.S. government debt securities	26,600	27,169	155	—	53,924
Corporate debt securities	—	11,619	531	—	12,150
Loans	—	46,955	1,144	—	48,099
Asset-backed securities	—	387	6	—	393
<b>Total debt instruments</b>	45,841	97,581	2,565	—	145,987
Equity securities	52,030	77	96	—	52,203
Physical commodities <sup>(b)</sup>	32	1,528	—	—	1,560
Other	—	14,037	268	—	14,305
<b>Total debt and equity instruments<sup>(c)</sup></b>	97,903	113,223	2,929	—	214,055
Derivative receivables:					
Interest rate	381	331,505	1,421	(306,094)	27,213
Credit	—	13,921	623	(13,891)	653
Foreign exchange	119	141,207	517	(132,840)	9,003
Equity	—	51,370	6,141	(50,882)	6,629
Commodity	—	24,131	100	(18,334)	5,897
<b>Total derivative receivables</b>	500	562,134	8,802	(522,041)	49,395
<b>Total trading assets<sup>(d)</sup></b>	98,403	675,357	11,731	(522,041)	263,450
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies <sup>(a)</sup>	—	110,117	—	—	110,117
Residential - nonagency	—	12,989	1	—	12,990
Commercial - nonagency	—	5,181	—	—	5,181
<b>Total mortgage-backed securities</b>	—	128,287	1	—	128,288
U.S. Treasury and government agencies	139,436	—	—	—	139,436
Obligations of U.S. states and municipalities	—	28,819	—	—	28,819
Certificates of deposit	—	77	—	—	77
Non-U.S. government debt securities	12,966	8,821	—	—	21,787
Corporate debt securities	—	845	—	—	845
Asset-backed securities:					
Collateralized loan obligations	—	24,991	—	—	24,991
Other	—	5,420	—	—	5,420
<b>Total available-for-sale securities</b>	152,402	197,260	1	—	349,663
Loans	—	7,104	—	—	7,104
Mortgage servicing rights	—	—	4,699	—	4,699
Other assets <sup>(d)</sup>	6,431	—	49	—	6,480
<b>Total assets measured at fair value on a recurring basis</b>	\$ 257,236	\$ 891,640	\$ 16,480	\$ (522,041)	\$ 643,315
Deposits	\$ —	\$ 25,290	\$ 3,372	\$ —	\$ 28,662
Federal funds purchased and securities loaned or sold under repurchase agreements	—	5,501	—	—	5,501
Short-term borrowings	—	2,349	1,516	—	3,865
Trading liabilities:					
Debt and equity instruments <sup>(c)</sup>	34,370	12,398	38	—	46,806
Derivative payables:					
Interest rate	434	303,116	2,695	(297,797)	8,448
Credit	—	14,014	738	(13,183)	1,569
Foreign exchange	111	147,039	1,477	(135,498)	13,129
Equity	—	52,139	7,626	(48,626)	11,139
Commodity	—	25,625	169	(19,242)	6,552
<b>Total derivative payables</b>	545	541,933	12,705	(514,346)	40,837
<b>Total trading liabilities</b>	34,915	554,331	12,743	(514,346)	87,643
Accounts payable and other liabilities	6,464	—	19	—	6,483
Long-term debt	—	24,903	15,368	—	40,271
<b>Total liabilities measured at fair value on a recurring basis</b>	\$ 41,379	\$ 612,374	\$ 33,018	\$ (514,346)	\$ 172,425

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December 31, 2018 (in millions)	Fair value hierarchy			Derivative netting adjustments <sup>(e)</sup>	Total fair value
	Level 1	Level 2	Level 3		
Federal funds sold and securities purchased under resale agreements	\$ —	\$ 4,370	\$ —	\$ —	\$ 4,370
Securities borrowed	—	5,105	—	—	5,105
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies <sup>(a)</sup>	—	29,330	487	—	29,817
Residential - nonagency	—	870	26	—	896
Commercial - nonagency	—	265	2	—	267
<b>Total mortgage-backed securities</b>	—	30,465	515	—	30,980
U.S. Treasury, GSEs and government agencies <sup>(a)</sup>	6,552	1	—	—	6,553
Obligations of U.S. states and municipalities	—	4,287	11	—	4,298
Certificates of deposit, bankers' acceptances and commercial paper	—	318	—	—	318
Non-U.S. government debt securities	27,828	27,056	155	—	55,039
Corporate debt securities	—	12,776	232	—	13,008
Loans	—	39,863	1,403	—	41,266
Asset-backed securities	—	400	24	—	424
<b>Total debt instruments</b>	34,380	115,166	2,340	—	151,886
Equity securities	44,725	259	94	—	45,078
Physical commodities <sup>(b)</sup>	506	—	—	—	506
Other	—	13,178	298	—	13,476
<b>Total debt and equity instruments<sup>(c)</sup></b>	79,611	128,603	2,732	—	210,946
Derivative receivables:					
Interest rate	443	275,760	1,841	(255,159)	22,885
Credit	—	18,014	857	(18,512)	359
Foreign exchange	776	167,719	853	(155,922)	13,426
Equity	—	60,504	6,584	(56,827)	10,261
Commodity	—	28,552	60	(22,005)	6,607
<b>Total derivative receivables</b>	1,219	550,549	10,195	(508,425)	53,538
<b>Total trading assets<sup>(d)</sup></b>	80,830	679,152	12,927	(508,425)	264,484
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies <sup>(a)</sup>	—	68,646	—	—	68,646
Residential - nonagency	—	8,519	1	—	8,520
Commercial - nonagency	—	6,585	—	—	6,585
<b>Total mortgage-backed securities</b>	—	83,750	1	—	83,751
U.S. Treasury and government agencies	56,059	—	—	—	56,059
Obligations of U.S. states and municipalities	—	36,152	—	—	36,152
Certificates of deposit	—	75	—	—	75
Non-U.S. government debt securities	15,313	8,789	—	—	24,102
Corporate debt securities	—	1,918	—	—	1,918
Asset-backed securities:					
Collateralized loan obligations	—	19,437	—	—	19,437
Other	—	7,218	—	—	7,218
<b>Total available-for-sale securities</b>	71,372	157,339	1	—	228,712
Loans	—	3,029	122	—	3,151
Mortgage servicing rights	—	—	6,130	—	6,130
Other assets <sup>(d)</sup>	5,696	—	12	—	5,708
<b>Total assets measured at fair value on a recurring basis</b>	\$ 157,898	\$ 848,995	\$ 19,192	\$ (508,425)	\$ 517,660
Deposits	\$ —	\$ 19,182	\$ 4,189	\$ —	\$ 23,371
Federal funds purchased and securities loaned or sold under repurchase agreements	—	5,215	—	—	5,215
Short-term borrowings	—	3,166	1,428	—	4,594
Trading liabilities:					
Debt and equity instruments <sup>(c)</sup>	56,196	18,329	46	—	74,571
Derivative payables:					
Interest rate	854	248,032	2,288	(244,215)	6,959
Credit	—	18,056	962	(17,632)	1,386
Foreign exchange	729	164,116	1,308	(153,427)	12,726
Equity	—	60,273	7,601	(57,692)	10,182
Commodity	—	28,605	1,233	(21,775)	8,063
<b>Total derivative payables</b>	1,583	519,082	13,392	(494,741)	39,316
<b>Total trading liabilities</b>	57,779	537,411	13,438	(494,741)	113,887
Accounts payable and other liabilities	5,757	—	—	—	5,757
Long-term debt	—	13,754	12,799	—	26,553
<b>Total liabilities measured at fair value on a recurring basis</b>	\$ 63,536	\$ 578,728	\$ 31,854	\$ (494,741)	\$ 179,377

- (a) At December 31, 2019 and 2018, included total U.S. GSE obligations of \$82.2 billion and \$57.2 billion, respectively, which were mortgage-related.
- (b) Physical commodities inventories are generally accounted for at the lower of cost or net realizable value. "Net realizable value" is a term defined in U.S. GAAP as not exceeding fair value less costs to sell ("transaction costs"). Transaction costs for the Bank's physical commodities inventories are either not applicable or immaterial to the value of the inventory. Therefore, net realizable value approximates fair value for the Bank's physical commodities inventories. When fair value hedging has been applied (or when net realizable value is below cost), the carrying value of physical commodities approximates fair value, because under fair value hedge accounting, the cost basis is adjusted for changes in fair value. Refer to Note 6 for a further discussion of the Bank's hedge accounting relationships. To provide consistent fair value disclosure information, all physical commodities inventories have been included in each period presented.
- (c) Balances reflect the reduction of securities owned (long positions) by the amount of identical securities sold but not yet purchased (short positions).

- (d) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not required to be classified in the fair value hierarchy. At December 31, 2019 and 2018, the fair values of these investments, which include certain hedge funds, private equity funds, real estate and other funds, were \$72 million and \$49 million, respectively. Included in these balances at December 31, 2019 and 2018, were trading assets of \$54 million and \$49 million, respectively, and other assets of \$18 million and zero, respectively.
- (e) As permitted under U.S. GAAP, the Bank has elected to net derivative receivables and derivative payables and the related cash collateral received and paid when a legally enforceable master netting agreement exists. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral. Additionally, includes derivative receivables and payables with affiliates on a net basis. Refer to Note 21 for information regarding our derivative activities with affiliates.

### Level 3 valuations

The Bank has established well-structured processes for determining fair value, including for instruments where fair value is estimated using significant unobservable inputs (level 3). Refer to pages 13–16 of this Note for further information on the Bank’s valuation process and a detailed discussion of the determination of fair value for individual financial instruments.

Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Bank. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, due to the lack of observability of significant inputs, management must assess relevant empirical data in deriving valuation inputs including transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents the Bank’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 Bank 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 Bank’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 Bank’s estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Bank and the relative distribution of instruments within the range of characteristics. For example, two option contracts may have similar levels of market risk exposure and valuation uncertainty, but may have significantly different implied volatility levels because the option contracts have different underlyings, tenors, or strike prices. The input range and weighted average values will therefore vary from period-to-period and parameter-to-parameter based on the characteristics of the instruments held by the Bank at each balance sheet date.

For the Bank’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 and equity-IR correlation inputs were concentrated in the middle of the range; commodity correlation inputs were concentrated in the middle of the range; credit correlation inputs were concentrated towards the lower end of the range; and forward equity prices and the interest rate-foreign exchange (“IR-FX”) correlation inputs were distributed across the range. In addition, the interest rate volatility and interest rate spread volatility inputs used in estimating fair value were distributed across the range; equity volatilities and commodity volatilities were concentrated towards the lower end of the range; and forward commodity prices used in estimating the fair value of commodity derivatives were concentrated in the middle of the range. Prepayment speed inputs used in estimating the fair value of interest rate derivatives were concentrated towards the lower end of the range. Recovery rate inputs used in estimating the fair value of credit derivatives were distributed across the range; credit spreads were concentrated towards the lower end of the range; conditional default rates and loss severity inputs were concentrated towards the upper end of the range and price inputs were concentrated towards the lower end of the range.

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## Level 3 inputs<sup>(a)</sup>

December 31, 2019							
Product/Instrument	Fair value (in millions)	Principal valuation technique	Unobservable inputs <sup>(b)</sup>	Range of input values		Weighted average	
Residential mortgage-backed securities and loans <sup>(b)</sup>	\$ 874	Discounted cash flows	Yield	3%	8%	6%	
			Prepayment speed	0%	- 22%	12%	
			Conditional default rate	0%	- 4%	0%	
			Loss severity	0%	- 39%	1%	
Commercial mortgage-backed securities and loans <sup>(c)</sup>	95	Market comparables	Price	\$0	- \$100	\$81	
Obligations of U.S. states and municipalities	6	Market comparables	Price	\$100		\$100	
Corporate debt securities	531	Market comparables	Price	\$5	- \$112	\$79	
Loans <sup>(d)</sup>	899	Market comparables	Price	\$3	- \$109	\$69	
Asset-backed securities	6	Market comparables	Price	\$51	- \$100	\$54	
Net interest rate derivatives	(1,337)	Option pricing	Interest rate volatility	6%	- 44%		
			Interest rate spread volatility	20bps	- 30bps		
			Interest rate correlation	(65)%	- 94%		
			IR-FX correlation	(58)%	- 40%		
			Prepayment speed	4%	- 30%		
Net credit derivatives	(151)	Discounted cash flows	Credit correlation	31%	- 59%		
			Credit spread	3bps	- 1,308bps		
			Recovery rate	15%	- 70%		
			Conditional default rate	2%	- 18%		
			Loss severity	100%			
Net foreign exchange derivatives	(822)	Option pricing	IR-FX correlation	(58)%	- 65%		
			Prepayment speed	9%			
Net equity derivatives	(1,485)	Option pricing	Forward equity price <sup>(h)</sup>	92%	- 105%		
			Equity volatility	9%	- 115%		
			Equity correlation	10%	- 97%		
			Equity-FX correlation	(81)%	- 60%		
			Equity-IR correlation	25%	- 35%		
Net commodity derivatives	(69)	Option pricing	Forward commodity price	\$39	- \$ 76 per barrel		
			Commodity volatility	5%	- 105%		
			Commodity correlation	(48)%	- 95%		
MSRs	4,699	Discounted cash flows	Refer to Note 16				
Other assets	317	Discounted cash flows	Credit spread	45bps		45bps	
Long-term debt, short-term borrowings, and deposits <sup>(e)</sup>	20,256	Option pricing	Interest rate volatility	6%	- 44%		
			Interest rate correlation	(65)%	- 94%		
			IR-FX correlation	(58)%	- 40%		
			Equity correlation	10%	- 97%		
			Equity-FX correlation	(81)%	- 60%		
Equity-IR correlation	25%	- 35%					
Other level 3 assets and liabilities, net <sup>(f)</sup>	194						

- (a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated balance sheets. Furthermore, the inputs presented for each valuation technique in the table are, in some cases, not applicable to every instrument valued using the technique as the characteristics of the instruments can differ.
- (b) Comprises U.S. GSEs and government agency securities of \$708 million, nonagency securities of \$15 million and trading loans of \$151 million.
- (c) Comprises nonagency securities of \$1 million and trading loans of \$94 million.
- (d) Comprises trading loans.
- (e) Long-term debt, short-term borrowings and deposits include structured notes issued by the Bank that are financial instruments that typically contain embedded derivatives. The estimation of the fair value of structured notes includes the derivative features embedded within the instrument. The significant unobservable inputs are broadly consistent with those presented for derivative receivables.
- (f) Includes level 3 assets and liabilities that are insignificant both individually and in aggregate.
- (g) Price is a significant unobservable input for certain instruments. When quoted market prices are not readily available, reliance is generally placed on price-based internal valuation techniques. The price input is expressed assuming a par value of \$100.
- (h) Forward equity price is expressed as a percentage of the current equity price.

### *Changes in and ranges of unobservable inputs*

The following discussion provides a description of the impact on a fair value measurement of a change in each unobservable input in isolation, and the interrelationship between unobservable inputs, where relevant and significant. The impact of changes in inputs may not be independent, as a change in one unobservable input may give rise to a change in another unobservable input. Where relationships do exist between two unobservable inputs, those relationships are discussed below. Relationships may also exist between observable and unobservable inputs (for example, as observable interest rates rise, unobservable prepayment rates decline); such relationships have not been included in the discussion below. In addition, for each of the individual relationships described below, the inverse relationship would also generally apply.

The following discussion also provides a description of attributes of the underlying instruments and external market factors that affect the range of inputs used in the valuation of the Bank's positions.

**Yield** - The yield of an asset is the interest rate used to discount future cash flows in a discounted cash flow calculation. An increase in the yield, in isolation, would result in a decrease in a fair value measurement.

**Credit spread** - The credit spread is the amount of additional annualized return over the market interest rate that a market participant would demand for taking exposure to the credit risk of an instrument. The credit spread for an instrument forms part of the discount rate used in a discounted cash flow calculation. Generally, an increase in the credit spread would result in a decrease in a fair value measurement.

The yield and the credit spread of a particular mortgage-backed security primarily reflect the risk inherent in the instrument. The yield is also impacted by the absolute level of the coupon paid by the instrument (which may not correspond directly to the level of inherent risk). Therefore, the range of yield and credit spreads reflects the range of risk inherent in various instruments owned by the Bank. The risk inherent in mortgage-backed securities is driven by the subordination of the security being valued and the characteristics of the underlying mortgages within the collateralized pool, including borrower FICO scores, loan-to-value ("LTV") ratios for residential mortgages and the nature of the property and/or any tenants for commercial mortgages. For corporate debt securities, obligations of U.S. states and municipalities and other similar instruments, credit spreads reflect the credit quality of the obligor and the tenor of the obligation.

**Prepayment speed** - The prepayment speed is a measure of the voluntary unscheduled principal repayments of a prepayable obligation in a collateralized pool. Prepayment speeds generally decline as borrower delinquencies rise. An increase in prepayment speeds, in isolation, would result in

a decrease in a fair value measurement of assets valued at a premium to par and an increase in a fair value measurement of assets valued at a discount to par.

Prepayment speeds may vary from collateral pool to collateral pool, and are driven by the type and location of the underlying borrower, and the remaining tenor of the obligation as well as the level and type (e.g., fixed or floating) of interest rate being paid by the borrower. Typically collateral pools with higher borrower credit quality have a higher prepayment rate than those with lower borrower credit quality, all other factors being equal.

**Conditional default rate** - The conditional default rate is a measure of the reduction in the outstanding collateral balance underlying a collateralized obligation as a result of defaults. While there is typically no direct relationship between conditional default rates and prepayment speeds, collateralized obligations for which the underlying collateral has high prepayment speeds will tend to have lower conditional default rates. An increase in conditional default rates would generally be accompanied by an increase in loss severity and an increase in credit spreads. An increase in the conditional default rate, in isolation, would result in a decrease in a fair value measurement. Conditional default rates reflect the quality of the collateral underlying a securitization and the structure of the securitization itself. Based on the types of securities owned in the Bank's market-making portfolios, conditional default rates are most typically at the lower end of the range presented.

**Loss severity** - The loss severity (the inverse concept is the recovery rate) is the expected amount of future realized losses resulting from the ultimate liquidation of a particular loan, expressed as the net amount of loss relative to the outstanding loan balance. An increase in loss severity is generally accompanied by an increase in conditional default rates. An increase in the loss severity, in isolation, would result in a decrease in a fair value measurement.

The loss severity applied in valuing a mortgage-backed security investment depends on factors relating to the underlying mortgages, including the LTV ratio, the nature of the lender's lien on the property and other instrument-specific factors.

**Correlation** - Correlation is a measure of the relationship between the movements of two variables. Correlation is a pricing input for a derivative product where the payoff is driven by one or more underlying risks. Correlation inputs are related to the type of derivative (e.g., interest rate, credit, equity, foreign exchange and commodity) due to the nature of the underlying risks. When parameters are positively correlated, an increase in one parameter will result in an increase in the other parameter. When parameters are negatively correlated, an increase in one parameter will result in a decrease in the other parameter. An increase in correlation can result in an increase or a decrease in a fair value measurement. Given a short

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correlation position, an increase in correlation, in isolation, would generally result in a decrease in a fair value measurement.

The level of correlation used in the valuation of derivatives with multiple underlying risks depends on a number of factors including the nature of those risks. For example, the correlation between two credit risk exposures would be different than that between two interest rate risk exposures. Similarly, the tenor of the transaction may also impact the correlation input, as the relationship between the underlying risks may be different over different time periods. Furthermore, correlation levels are very much dependent on market conditions and could have a relatively wide range of levels within or across asset classes over time, particularly in volatile market conditions.

Volatility - Volatility is a measure of the variability in possible returns for an instrument, parameter or market index given how much the particular instrument, parameter or index changes in value over time. Volatility is a pricing input for options, including equity options, commodity options, and interest rate options. Generally, the higher the volatility of the underlying, the riskier the instrument. Given a long position in an option, an increase in volatility, in isolation, would generally result in an increase in a fair value measurement.

The level of volatility used in the valuation of a particular option-based derivative depends on a number of factors, including the nature of the risk underlying the option (e.g., the volatility of a particular equity security may be significantly different from that of a particular commodity index), the tenor of the derivative as well as the strike price of the option.

Forward price - Forward price is the price at which the buyer agrees to purchase the asset underlying a forward contract on the predetermined future delivery date, and is such that the value of the contract is zero at inception.

The forward price is used as an input in the valuation of certain derivatives and depends on a number of factors including interest rates, the current price of the underlying asset, and the expected income to be received and costs to be incurred by the seller as a result of holding that asset until the delivery date. An increase in the forward can result in an increase or a decrease in a fair value measurement.

### Changes in level 3 recurring fair value measurements

The following tables include a rollforward of the Consolidated balance sheets amounts (including changes in fair value) for financial instruments classified by the Bank within level 3 of the fair value hierarchy for the years ended December 31, 2019, 2018 and 2017. When a determination is made to classify a financial instrument within level 3, the determination is based on the significance of the unobservable inputs to the overall fair value measurement. However, level 3 financial instruments typically include, in addition to the unobservable or level 3 components, observable components (that is, components that are actively quoted and can be validated to external sources); accordingly, the gains and losses in the table below include changes in fair value due in part to observable factors that are part of the valuation methodology. Also, the Bank risk-manages the observable components of level 3 financial instruments using securities and derivative positions that are classified within level 1 or 2 of the fair value hierarchy; as these level 1 and level 2 risk management instruments are not included below, the gains or losses in the following tables do not reflect the effect of the Bank's risk management activities related to such level 3 instruments.

Year ended December 31, 2019 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2019	
	Fair value at January 1, 2019	Total realized/ unrealized gains/ (losses)	Purchases <sup>(f)</sup>	Sales	Settlements <sup>(g)</sup>	Transfers into level 3 <sup>(h)</sup>	Transfers (out of) level 3 <sup>(h)</sup>	Fair value at Dec. 31, 2019		
<b>Assets:<sup>(a)</sup></b>										
Trading assets:										
Debt instruments:										
Mortgage-backed securities:										
U.S. GSEs and government agencies	\$ 487	\$ (55)	\$ 661	\$ (261)	\$ (124)	\$ –	\$ –	\$ 708	\$ (56)	
Residential - nonagency	26	23	11	(32)	(2)	–	(12)	14	–	
Commercial - nonagency	2	2	–	–	(4)	1	–	1	2	
<b>Total mortgage-backed securities</b>	<b>515</b>	<b>(30)</b>	<b>672</b>	<b>(293)</b>	<b>(130)</b>	<b>1</b>	<b>(12)</b>	<b>723</b>	<b>(54)</b>	
U.S. Treasury, GSEs and government agencies	–	–	–	–	–	–	–	–	–	
Obligations of U.S. states and municipalities	11	–	–	–	(5)	–	–	6	–	
Non-U.S. government debt securities	155	1	290	(287)	–	14	(18)	155	4	
Corporate debt securities	232	28	369	(123)	(17)	103	(61)	531	(12)	
Loans	1,403	99	656	(685)	(332)	545	(542)	1,144	30	
Asset-backed securities	24	(3)	–	(10)	(4)	3	(4)	6	(5)	
<b>Total debt instruments</b>	<b>2,340</b>	<b>95</b>	<b>1,987</b>	<b>(1,398)</b>	<b>(488)</b>	<b>666</b>	<b>(637)</b>	<b>2,565</b>	<b>(37)</b>	
Equity securities	94	5	38	(21)	(22)	46	(44)	96	15	
Other	298	12	84	(128)	(53)	61	(6)	268	(30)	
<b>Total trading assets - debt and equity instruments</b>	<b>2,732</b>	<b>112</b> <sup>(c)</sup>	<b>2,109</b>	<b>(1,547)</b>	<b>(563)</b>	<b>773</b>	<b>(687)</b>	<b>2,929</b>	<b>(52)</b> <sup>(c)</sup>	
Net derivative receivables: <sup>(b)</sup>										
Interest rate	(447)	(665)	107	(768)	444	(71)	126	(1,274)	(691)	
Credit	(105)	7	20	(8)	(14)	29	(44)	(115)	53	
Foreign exchange	(455)	(557)	14	(409)	467	(21)	1	(960)	(434)	
Equity	(1,017)	473	1,815	(504)	(2,250)	121	(123)	(1,485)	(172)	
Commodity	(1,173)	458	49	(365)	85	(1)	878	(69)	238	
<b>Total net derivative receivables</b>	<b>(3,197)</b>	<b>(284)</b> <sup>(c)</sup>	<b>2,005</b>	<b>(2,054)</b>	<b>(1,268)</b>	<b>57</b>	<b>838</b>	<b>(3,903)</b>	<b>(1,006)</b> <sup>(c)</sup>	
Available-for-sale securities:										
Mortgage-backed securities	1	–	–	–	–	–	–	1	–	
Asset-backed securities	–	–	–	–	–	–	–	–	–	
<b>Total available-for-sale securities</b>	<b>1</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>1</b>	<b>–</b>	
Loans	122	4	–	–	(125)	–	(1)	–	–	
Mortgage servicing rights	6,130	(1,180)	1,489	(789)	(951)	–	–	4,699	(1,180)	
Other assets	12	11	26	–	–	–	–	49	6	
<b>Fair value measurements using significant unobservable inputs</b>										
Year ended December 31, 2019 (in millions)	Fair value at January 1, 2019	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements <sup>(g)</sup>	Transfers into level 3 <sup>(h)</sup>	Transfers (out of) level 3 <sup>(h)</sup>	Fair value at Dec. 31, 2019	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2019
<b>Liabilities:<sup>(a)</sup></b>										
Deposits	\$ 4,189	\$ 295	\$ –	\$ –	\$ 918	\$ (832)	\$ 12	\$ (1,210)	\$ 3,372	\$ 311
Short-term borrowings	1,428	145	–	–	3,092	(2,977)	19	(191)	1,516	112
Trading liabilities - debt and equity instruments	46	(2)	(13)	37	–	1	9	(40)	38	2
Accounts payable and other liabilities	–	9	–	10	–	–	–	–	19	9
Long-term debt	12,799	1,316	–	–	7,317	(5,167)	280	(1,177)	15,368	1,646

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Year ended December 31, 2018 (in millions)	Fair value measurements using significant unobservable inputs							Fair value at Dec. 31, 2018	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2018	
	Fair value at January 1, 2018	Total realized/ unrealized gains/ (losses)	Purchases <sup>(f)</sup>	Sales	issuances	Settlements <sup>(g)</sup>	Transfers into level 3 <sup>(h)</sup>			Transfers (out of) level 3 <sup>(h)</sup>
<b>Assets:<sup>(a)</sup></b>										
Trading assets:										
Debt instruments:										
Mortgage-backed securities:										
U.S. GSEs and government agencies	\$ 289	\$ (16)	\$ 443	\$ (164)		\$ (65)	\$ –	\$ –	\$ 487	\$ (21)
Residential - nonagency	24	(1)	33	(41)		(2)	15	(2)	26	1
Commercial - nonagency	2	1	–	–		(1)	–	–	2	(2)
<b>Total mortgage-backed securities</b>	<b>315</b>	<b>(16)</b>	<b>476</b>	<b>(205)</b>		<b>(68)</b>	<b>15</b>	<b>(2)</b>	<b>515</b>	<b>(22)</b>
U.S. Treasury, GSEs and government agencies	1	–	–	–		–	–	(1)	–	–
Obligations of U.S. states and municipalities	15	1	–	–		(5)	–	–	11	1
Non-U.S. government debt securities	78	(22)	458	(277)		(11)	23	(94)	155	(9)
Corporate debt securities	191	(16)	331	(284)		(26)	230	(194)	232	13
Loans	2,332	28	1,250	(1,655)		(465)	751	(838)	1,403	(28)
Asset-backed securities	51	–	14	–		(19)	–	(22)	24	9
<b>Total debt instruments</b>	<b>2,983</b>	<b>(25)</b>	<b>2,529</b>	<b>(2,421)</b>		<b>(594)</b>	<b>1,019</b>	<b>(1,151)</b>	<b>2,340</b>	<b>(36)</b>
Equity securities	121	(33)	92	(99)		–	84	(71)	94	24
Other	350	11	408	(223)		(209)	49	(88)	298	34
<b>Total trading assets - debt and equity instruments</b>	<b>3,454</b>	<b>(47)</b> <sup>(c)</sup>	<b>3,029</b>	<b>(2,743)</b>		<b>(803)</b>	<b>1,152</b>	<b>(1,310)</b>	<b>2,732</b>	<b>22</b> <sup>(c)</sup>
Net derivative receivables: <sup>(b)</sup>										
Interest rate	258	271	111	(641)		(557)	(27)	138	(447)	349
Credit	(33)	(37)	5	(6)		(57)	1	22	(105)	(27)
Foreign exchange	(441)	133	182	(290)		34	(115)	42	(455)	5
Equity	(1,887)	18	2,966	(1,769)		(1,555)	1,037	173	(1,017)	(133)
Commodity	(648)	(54)	8	(175)		(324)	(3)	23	(1,173)	47
<b>Total net derivative receivables</b>	<b>(2,751)</b>	<b>331</b> <sup>(c)</sup>	<b>3,272</b>	<b>(2,881)</b>		<b>(2,459)</b>	<b>893</b>	<b>398</b>	<b>(3,197)</b>	<b>241</b> <sup>(c)</sup>
Available-for-sale securities:										
Mortgage-backed securities	1	–	–	–		–	–	–	1	–
Asset-backed securities	276	1	–	–		(277)	–	–	–	–
<b>Total available-for-sale securities</b>	<b>277</b>	<b>1</b> <sup>(f)</sup>	<b>–</b>	<b>–</b>		<b>(277)</b>	<b>–</b>	<b>–</b>	<b>1</b>	<b>–</b>
Loans	276	(7) <sup>(c)</sup>	123	–		(196)	–	(74)	122	(7) <sup>(c)</sup>
Mortgage servicing rights	6,030	230 <sup>(d)</sup>	1,246	(636)		(740)	–	–	6,130	230 <sup>(d)</sup>
Other assets	–	– <sup>(c)</sup>	14	(2)		–	–	–	12	–
<b>Fair value measurements using significant unobservable inputs</b>										
Year ended December 31, 2018 (in millions)	Fair value measurements using significant unobservable inputs							Fair value at Dec. 31, 2018	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2018	
	Fair value at January 1, 2018	Total realized/ unrealized (gains)/ losses	Purchases	Sales	issuances	Settlements <sup>(g)</sup>	Transfers into level 3 <sup>(h)</sup>			Transfers (out of) level 3 <sup>(h)</sup>
<b>Liabilities:<sup>(a)</sup></b>										
Deposits	\$ 4,150	\$ (135) <sup>(c)(e)</sup>	\$ –	\$ –	\$ 1,400	\$ (560)	\$ 2	\$ (668)	\$ 4,189	\$ (192) <sup>(c)(e)</sup>
Short-term borrowings	1,604	(188) <sup>(c)(e)</sup>	–	–	3,031	(2,999)	87	(107)	1,428	(129) <sup>(c)(e)</sup>
Trading liabilities - debt and equity instruments	37	30 <sup>(c)</sup>	(97)	101	–	(1)	10	(34)	46	16 <sup>(c)</sup>
Accounts payable and other liabilities	–	–	–	–	–	–	–	–	–	–
Long-term debt	10,154	(1,442) <sup>(c)(e)</sup>	–	–	7,465	(2,968)	623	(1,033)	12,799	(651) <sup>(c)(e)</sup>

Fair value measurements using significant unobservable inputs										
Year ended December 31, 2017 (in millions)	Fair value at January 1, 2017	Total realized/unrealized gains/(losses)	Purchases <sup>(f)</sup>	Sales	Settlements <sup>(g)</sup>	Transfers into level 3 <sup>(h)</sup>	Transfers (out of) level 3 <sup>(h)</sup>	Fair value at Dec. 31, 2017	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2017	
<b>Assets:<sup>(a)</sup></b>										
Trading assets:										
Debt instruments:										
Mortgage-backed securities:										
U.S. GSEs and government agencies	\$ 369	\$ (11)	\$ 155	\$ (163)	\$ (61)	\$ –	\$ –	\$ 289	\$ (17)	
Residential - nonagency	11	3	5	–	(4)	18	(9)	24	4	
Commercial - nonagency	6	5	1	(5)	(9)	4	–	2	–	
<b>Total mortgage-backed securities</b>	<b>386</b>	<b>(3)</b>	<b>161</b>	<b>(168)</b>	<b>(74)</b>	<b>22</b>	<b>(9)</b>	<b>315</b>	<b>(13)</b>	
U.S. Treasury, GSEs and government agencies	–	–	–	–	–	1	–	1	–	
Obligations of U.S. states and municipalities	19	1	–	–	(5)	–	–	15	1	
Non-U.S. government debt securities	46	–	560	(519)	–	62	(71)	78	–	
Corporate debt securities	318	13	514	(472)	(121)	101	(162)	191	5	
Loans	4,325	225	2,172	(2,613)	(1,071)	760	(1,466)	2,332	44	
Asset-backed securities	70	23	243	(251)	(14)	25	(45)	51	6	
<b>Total debt instruments</b>	<b>5,164</b>	<b>259</b>	<b>3,650</b>	<b>(4,023)</b>	<b>(1,285)</b>	<b>971</b>	<b>(1,753)</b>	<b>2,983</b>	<b>43</b>	
Equity securities	89	33	51	(44)	(5)	16	(19)	121	23	
Other	281	133	151	(51)	(205)	60	(19)	350	110	
<b>Total trading assets - debt and equity instruments</b>	<b>5,534</b>	<b>425</b> <sup>(c)</sup>	<b>3,852</b>	<b>(4,118)</b>	<b>(1,495)</b>	<b>1,047</b>	<b>(1,791)</b>	<b>3,454</b>	<b>176</b> <sup>(c)</sup>	
Net derivative receivables: <sup>(b)</sup>										
Interest rate	1,001	(87)	142	(194)	(494)	41	(151)	258	(688)	
Credit	96	(170)	5	(6)	–	81	(39)	(33)	7	
Foreign exchange	(1,531)	1	12	(23)	893	(33)	240	(441)	9	
Equity	(1,488)	(243)	2,106	(1,162)	(943)	26	(183)	(1,887)	172	
Commodity	35	(329)	–	–	(375)	39	(18)	(648)	22	
<b>Total net derivative receivables</b>	<b>(1,887)</b>	<b>(828)</b> <sup>(c)</sup>	<b>2,265</b>	<b>(1,385)</b>	<b>(919)</b>	<b>154</b>	<b>(151)</b>	<b>(2,751)</b>	<b>(478)</b> <sup>(c)</sup>	
Available-for-sale securities:										
Mortgage-backed securities	1	–	–	–	–	–	–	1	–	
Asset-backed securities	663	15	–	(50)	(352)	–	–	276	14	
<b>Total available-for-sale securities</b>	<b>664</b>	<b>15</b> <sup>(f)</sup>	<b>–</b>	<b>(50)</b>	<b>(352)</b>	<b>–</b>	<b>–</b>	<b>277</b>	<b>14</b> <sup>(f)</sup>	
Loans	568	34	1	(26)	(301)	–	–	276	3	
Mortgage servicing rights	6,096	(232)	1,103	(140)	(797)	–	–	6,030	(232)	
Other assets	41	9	–	(13)	(37)	–	–	–	–	

Fair value measurements using significant unobservable inputs										
Year ended December 31, 2017 (in millions)	Fair value at January 1, 2017	Total realized/unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements <sup>(g)</sup>	Transfers into level 3 <sup>(h)</sup>	Transfers (out of) level 3 <sup>(h)</sup>	Fair value at Dec. 31, 2017	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2017
<b>Liabilities:<sup>(a)</sup></b>										
Deposits	\$ 2,121	\$ 169	\$ –	\$ –	\$ 2,990	\$ (287)	\$ 12	\$ (855)	\$ 4,150	\$ 192
Short-term borrowings	1,019	102	–	–	3,019	(2,488)	147	(195)	1,604	109
Trading liabilities - debt and equity instruments	36	(2)	(43)	45	–	1	–	–	37	–
Accounts payable and other liabilities	–	–	–	–	–	–	–	–	–	–
Long-term debt	7,662	1,080	–	–	7,613	(7,213)	1,398	(386)	10,154	761

# Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
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- (a) Level 3 assets as a percentage of total Bank assets accounted for at fair value (including assets measured at fair value on a nonrecurring basis) were 3%, 4% and 5% at December 31, 2019, 2018 and 2017, respectively. Level 3 liabilities as a percentage of total Bank liabilities accounted for at fair value (including liabilities measured at fair value on a nonrecurring basis) were 19%, 18% and 19% at December 31, 2019, 2018 and 2017, respectively.
- (b) All level 3 derivatives are presented on a net basis, irrespective of underlying counterparty.
- (c) Predominantly reported in principal transactions revenue, except for changes in fair value for mortgage loans, and lending-related commitments originated with the intent to sell, and mortgage loan purchase commitments, which are reported in mortgage fees and related income.
- (d) Changes in fair value for MSRs are reported in mortgage fees and related income.
- (e) Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue, and they were not material for the years ended December 31, 2019, 2018 and 2017, respectively. Unrealized (gains)/losses are reported in OCI, and they were \$175 million, \$(161) million and \$6 million for the years ended December 31, 2019, 2018 and 2017, respectively.
- (f) Loan originations are included in purchases.
- (g) Includes financial assets and liabilities that have matured, been partially or fully repaid, impacts of modifications, deconsolidation associated with beneficial interests in VIEs and other items.
- (h) All transfers into and/or out of level 3 are based on changes in the observability and/or significance of the valuation inputs and are assumed to occur at the beginning of the quarterly reporting period in which they occur.
- (i) Realized gains/(losses) on AFS securities, as well as other-than-temporary impairment ("OTTI") losses that are recorded in earnings, are reported in investment securities gains/(losses). Unrealized gains/(losses) are reported in OCI. There were no realized gains/(losses) and foreign exchange hedge accounting adjustments recorded in income on AFS securities for the years ended December 31, 2019 and 2017, respectively, and \$1 million recorded for the year ended December 31, 2018. There were no unrealized gains/(losses) recorded on AFS securities in OCI for the years ended December 31, 2019 and 2018, respectively, and \$15 million recorded for the year ended December 31, 2017.

## Level 3 analysis

### Consolidated balance sheets changes

Level 3 assets (including assets measured at fair value on a nonrecurring basis) were 0.7% of total Bank assets at December 31, 2019. The following describes significant changes to level 3 assets since December 31, 2018, for those items measured at fair value on a recurring basis. Refer to Assets and liabilities measured at fair value on a nonrecurring basis on page 27 for further information on changes impacting items measured at fair value on a nonrecurring basis.

### For the year ended December 31, 2019

Level 3 assets were \$16.5 billion at December 31, 2019, reflecting a decrease of \$2.7 billion from December 31, 2018, largely due to a \$1.4 billion decrease in MSRs. Refer to the Gains and losses section below for additional information.

### 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:

- \$859 million of gross equity derivative receivables as a result of a decrease in observability and an increase in the significance of unobservable inputs.

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

- \$2.0 billion of gross equity derivative receivables and \$1.9 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- \$1.0 billion of gross commodities derivative payables as a result of an increase in observability.
- \$1.2 billion of deposits driven by an increase in observability and a decrease in the significance of unobservable inputs.
- \$1.2 billion of long-term debt driven by an increase in observability and a decrease in the significance of unobservable inputs.

During the year ended December 31, 2018, significant transfers from level 2 into level 3 included the following:

- \$1.2 billion of total debt and equity instruments, the majority of which were trading loans, driven by a decrease in observability.
- \$2.7 billion of gross equity derivative receivables and \$1.7 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.

During the year ended December 31, 2018, significant transfers from level 3 into level 2 included the following:

- \$1.3 billion of total debt and equity instruments, the majority of which were trading loans, driven by an increase in observability.
- \$2.0 billion of gross equity derivative receivables and \$2.2 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- \$1.0 billion of long-term debt driven by an increase in observability.

During the year ended December 31, 2017, significant transfers from level 2 into level 3 included the following:

- \$3.4 billion of gross equity derivative receivables and \$3.4 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- \$1.4 billion of long-term debt driven by a decrease in observability.

During the year ended December 31, 2017, significant transfers from level 3 into level 2 included the following:

- \$1.8 billion of equity derivative receivables and \$1.6 billion of equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- \$1.5 billion of trading loans driven by an increase in observability.

All transfers are based on changes in the observability and/or significance of the valuation inputs and are assumed to occur at the beginning of the quarterly reporting period in which they occur.

### Gains and losses

The following describes significant components of total realized/unrealized gains/(losses) for instruments measured at fair value on a recurring basis for the years ended December 31, 2019, 2018 and 2017.

These amounts exclude any effects of the Bank's risk management activities where the financial instruments are classified as level 1 and 2 of the fair value hierarchy. Refer to Changes in level 3 recurring fair value measurements rollforward tables on pages 22-26 for further information on these instruments.

### 2019

- \$1.3 billion of net losses on assets predominantly driven by MSRs reflecting faster prepayment speeds on lower rates. Refer to Note 16 for information on MSRs.
- \$1.8 billion of net losses on liabilities largely driven by market movements in long-term debt.

### 2018

- \$1.7 billion of net gains on liabilities predominantly driven by market movements in long-term debt.

### 2017

- \$1.3 billion of net losses on liabilities largely driven by market movements in long-term debt.

### Assets and liabilities measured at fair value on a nonrecurring basis

The following tables present the assets held as of December 31, 2019 and 2018, respectively, for which a nonrecurring fair value adjustment was recorded during the years ended December 31, 2019 and 2018, respectively, by major product category and fair value hierarchy.

December 31, 2019 (in millions)	Fair value hierarchy			Total fair value
	Level 1	Level 2	Level 3	
Loans	\$ —	\$ 3,463 <sup>(b)</sup>	\$ 269 <sup>(c)</sup>	\$ 3,732
Other assets <sup>(a)</sup>	—	14	585	599
<b>Total assets measured at fair value on a nonrecurring basis</b>	<b>\$ —</b>	<b>\$ 3,477</b>	<b>\$ 854</b>	<b>\$ 4,331</b>

December 31, 2018 (in millions)	Fair value hierarchy			Total fair value
	Level 1	Level 2	Level 3	
Loans	\$ —	\$ 273	\$ 251	\$ 524
Other assets	—	9	433	442
<b>Total assets measured at fair value on a nonrecurring basis</b>	<b>\$ —</b>	<b>\$ 282</b>	<b>\$ 684</b>	<b>\$ 966</b>

(a) Primarily includes equity securities without readily determinable fair values that were adjusted based on observable price changes in orderly transactions from an identical or similar investment of the same issuer (measurement alternative). Of the \$585 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2019, \$343 million related to such equity securities. These equity securities are classified as level 3 due to the infrequency of the observable prices and/or the restrictions on the shares.

(b) Primarily includes certain mortgage loans that were reclassified to held-for-sale.

(c) Of the \$269 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2019, \$248 million related to residential real estate loans carried at the net realizable value of the underlying collateral (e.g., collateral-dependent loans and other loans charged off in accordance with regulatory guidance). These amounts are classified as level 3 as they are valued using information from broker's price opinions, appraisals and automated valuation models and discounted based upon the Bank's experience with actual liquidation values. These discounts ranged from 14% to 49% with a weighted average of 28%.

There were no liabilities measured at fair value on a nonrecurring basis at December 31, 2019 and 2018.

### Nonrecurring fair value changes

The following table presents the total change in value of assets and liabilities for which a fair value adjustment has been recognized for the years ended December 31, 2019, 2018 and 2017, related to assets and liabilities held at those dates.

December 31, (in millions)	2019	2018	2017
Loans	\$ (272) <sup>(a)</sup>	\$ (63)	\$ (159)
Other assets	62 <sup>(b)</sup>	225 <sup>(b)</sup>	(141)
Accounts payable and other liabilities	—	—	(1)
<b>Total nonrecurring fair value gains/(losses)</b>	<b>\$ (210)</b>	<b>\$ 162</b>	<b>\$ (301)</b>

(a) Primarily includes the impact of certain mortgage loans that were reclassified to held-for-sale.

(b) Included \$82 million and \$241 million for the years ended December 31, 2019 and 2018, respectively, of net gains as a result of the measurement alternative.

Refer to Note 13 for further information about the measurement of impaired collateral-dependent loans, and other loans where the carrying value is based on the fair value of the underlying collateral (e.g., residential mortgage loans charged off in accordance with regulatory guidance).

### Equity securities without readily determinable fair values

The Bank measures certain equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer, with such changes recognized in other income.

In its determination of the new carrying values upon observable price changes, the Bank may adjust the prices if deemed necessary to arrive at the Bank's estimated fair values. Such adjustments may include adjustments to reflect the different rights and obligations of similar securities, and other adjustments that are consistent with the Bank's valuation techniques for private equity direct investments.

The following table presents the carrying value of equity securities without readily determinable fair values held as of December 31, 2019 and 2018, that are measured under the measurement alternative and the related adjustments recorded during the periods presented for those securities with observable price changes. These securities are included in the nonrecurring fair value tables when applicable price changes are observable.

As of or for the year ended December 31,			
(in millions)		2019	2018
<b>Other assets</b>			
Carrying value	\$	589	\$ 464
Upward carrying value changes <sup>(a)</sup>		86	253
Downward carrying value changes/impairment <sup>(b)</sup>		(4)	(12)

(a) The cumulative upward carrying value changes between January 1, 2018 and December 31, 2019 were \$339 million.

(b) The cumulative downward carrying value changes/impairment between January 1, 2018 and December 31, 2019 were \$(15) million.

Included in other assets above is the Bank's interest in approximately 40 million Visa Class B shares, recorded at a nominal carrying value. These shares are subject to certain transfer restrictions currently and will be convertible into Visa Class A shares upon final resolution of certain litigation matters involving Visa. The conversion rate of Visa Class B shares into Visa Class A shares is 1.6228 at December 31, 2019, and may be adjusted by Visa depending on developments related to the litigation matters.

### Additional disclosures about the fair value of financial instruments that are not carried on the Consolidated balance sheets at fair value

U.S. GAAP requires disclosure of the estimated fair value of certain financial instruments, which are included in the following table. However, this table does not include other items, such as nonfinancial assets, intangible assets, certain financial instruments, and customer relationships. In the opinion of management, these items, in the aggregate, add significant value to the Bank, but their fair value is not disclosed in this table.

#### *Financial instruments for which carrying value approximates fair value*

Certain financial instruments that are not carried at fair value on the Consolidated balance sheets are carried at amounts that approximate fair value, due to their short-term nature and generally negligible credit risk. These instruments include cash and due from banks, deposits with banks, federal funds sold, securities purchased under resale agreements and securities borrowed, short-term receivables and accrued interest receivable, short-term borrowings, federal funds purchased, securities loaned and sold under repurchase agreements, accounts payable, and accrued liabilities. In addition, U.S. GAAP requires that the fair value of deposit liabilities with no stated maturity (i.e., demand, savings and certain money market deposits) be equal to their carrying value; recognition of the inherent funding value of these instruments is not permitted.

The following table presents by fair value hierarchy classification the carrying values and estimated fair values at December 31, 2019 and 2018, of financial assets and liabilities, excluding financial instruments that are carried at fair value on a recurring basis, and their classification within the fair value hierarchy.

(in billions)	December 31, 2019					December 31, 2018				
	Carrying value	Estimated fair value hierarchy			Total estimated fair value	Carrying value	Estimated fair value hierarchy			Total estimated fair value
		Level 1	Level 2	Level 3			Level 1	Level 2	Level 3	
<b>Financial assets</b>										
Cash and due from banks	\$ 21.2	\$ 21.2	\$ —	\$ —	\$ 21.2	\$ 21.6	\$ 21.6	\$ —	\$ —	\$ 21.6
Deposits with banks	241.0	241.0	—	—	241.0	255.1	255.1	—	—	255.1
Accrued interest and accounts receivable	52.8	—	52.8	—	52.8	48.8	—	48.7	0.1	48.8
Federal funds sold and securities purchased under resale agreements	205.7	—	205.7	—	205.7	271.1	—	271.1	—	271.1
Securities borrowed	32.5	—	32.5	—	32.5	40.2	—	40.2	—	40.2
Investment securities, held-to-maturity	47.5	0.1	48.8	—	48.9	31.4	—	31.5	—	31.5
Loans, net of allowance for loan losses <sup>(a)</sup>	938.0	—	213.1	733.2	946.3	966.6	—	239.8	725.5	965.3
Other	53.9	—	53.2	0.7	53.9	44.4	—	43.7	0.8	44.5
<b>Financial liabilities</b>										
Deposits	\$ 1,621.8	\$ —	\$ 1,622.1	\$ —	\$ 1,622.1	\$ 1,534.0	\$ —	\$ 1,534.0	\$ —	\$ 1,534.0
Federal funds purchased and securities loaned or sold under repurchase agreements	81.0	—	81.0	—	81.0	102.6	—	102.6	—	102.6
Short-term borrowings	4.7	—	4.7	—	4.7	17.3	—	17.3	—	17.3
Accounts payable and other liabilities	73.3	0.1	70.1	2.7	72.9	75.8	0.2	73.0	2.3	75.5
Beneficial interests issued by consolidated VIEs	17.8	—	17.9	—	17.9	20.3	—	20.2	—	20.2
Long-term debt and junior subordinated deferrable interest debentures	81.2	—	77.8	3.5	81.3	83.7	—	80.2	3.3	83.5

(a) Fair value is typically estimated using a discounted cash flow model that incorporates the characteristics of the underlying loans (including principal, contractual interest rate and contractual fees) and other key inputs, including expected lifetime credit losses, interest rates, prepayment rates, and primary origination or secondary market spreads. For certain loans, the fair value is measured based on the value of the underlying collateral. The difference between the estimated fair value and carrying value of a financial asset or liability is the result of the different methodologies used to determine fair value as compared with carrying value. For example, credit losses are estimated for a financial asset's remaining life in a fair value calculation but are estimated for a loss emergence period in the allowance for loan losses calculation; future loan income (interest and fees) is incorporated in a fair value calculation but is generally not considered in the allowance for loan losses.

The majority of the Bank's lending-related commitments are not carried at fair value on a recurring basis on the Consolidated balance sheets. The carrying value of the wholesale allowance for lending-related commitments and the estimated fair value of these wholesale lending-related commitments were as follows for the periods indicated.

(in billions)	December 31, 2019					December 31, 2018				
	Carrying value <sup>(a)</sup>	Estimated fair value hierarchy			Total estimated fair value	Carrying value <sup>(a)</sup>	Estimated fair value hierarchy			Total estimated fair value <sup>(b)</sup>
		Level 1	Level 2	Level 3			Level 1	Level 2	Level 3	
Wholesale lending-related commitments	\$ 1.2	\$ —	\$ —	\$ 1.9	\$ 1.9	\$ 1.0	\$ —	\$ —	\$ 2.2	\$ 2.2

(a) Excludes the current carrying values of the guarantee liability and the offsetting asset, each of which is recognized at fair value at the inception of the guarantees.

(b) The prior period amounts have been revised to conform with the current period presentation.

The Bank does not estimate the fair value of consumer lending-related commitments. In many cases, the Bank can reduce or cancel these commitments by providing the borrower notice or, in some cases as permitted by law, without notice. Refer to page 15 of this Note for a further discussion of the valuation of lending-related commitments.

## Notes to consolidated financial statements

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### Note 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, unrecognized firm commitments, and written loan commitments.

The Bank has elected to measure certain instruments at fair value for several reasons including to mitigate income statement volatility caused by the differences between the measurement basis of elected instruments (e.g., certain instruments that otherwise would be accounted for on an accrual basis) and the associated risk management arrangements that are accounted for on a fair value basis, as well as to better reflect those instruments that are managed on a fair value basis.

The Bank's election of fair value includes the following instruments:

- Loans purchased or originated as part of securitization warehousing activity, subject to bifurcation accounting, or managed on a fair value basis, including lending-related commitments
- Certain securities financing agreements, such as those with an embedded derivative and/or a maturity of greater than one year
- Owned beneficial interests in securitized financial assets that contain embedded credit derivatives, which would otherwise be required to be separately accounted for as a derivative instrument
- Structured notes, which are predominantly financial instruments that contain embedded derivatives, that are issued as part of client-driven activities
- Certain long-term beneficial interests issued by consolidated securitization trusts where the underlying assets are carried at fair value

## Changes in fair value under the fair value option election

The following table presents the changes in fair value included in the Consolidated statements of income for the years ended December 31, 2019, 2018 and 2017, for items for which the fair value option was elected. The profit and loss information presented below only includes the financial instruments that were elected to be measured at fair value; related risk management instruments, which are required to be measured at fair value, are not included in the table.

December 31, (in millions)	2019			2018			2017		
	Principal transactions	All other income	Total changes in fair value recorded <sup>(d)</sup>	Principal transactions	All other income	Total changes in fair value recorded <sup>(d)</sup>	Principal transactions	All other income	Total changes in fair value recorded <sup>(d)</sup>
Federal funds sold and securities purchased under resale agreements	\$ 4	\$ —	\$ 4	\$ 2	\$ —	\$ 2	\$ 22	\$ —	\$ 22
Securities borrowed	133	—	133	22	—	22	50	—	50
Trading assets:									
Debt and equity instruments, excluding loans	2,496	—	2,496	(1,881)	1 <sup>(c)</sup>	(1,880)	1,851	2 <sup>(c)</sup>	1,853
Loans reported as trading assets:									
Changes in instrument-specific credit risk	723	2 <sup>(c)</sup>	725	393	—	393	298	14 <sup>(c)</sup>	312
Other changes in fair value	254	1,224 <sup>(c)</sup>	1,478	159	185 <sup>(c)</sup>	344	216	747 <sup>(c)</sup>	963
Loans:									
Changes in instrument-specific credit risk	(26)	—	(26)	(1)	—	(1)	(1)	—	(1)
Other changes in fair value	1	—	1	(1)	—	(1)	(12)	3 <sup>(c)</sup>	(9)
Other assets	7	—	7	—	—	—	—	3 <sup>(e)</sup>	3
Deposits <sup>(a)</sup>	(1,751)	—	(1,751)	181	—	181	(546)	—	(546)
Federal funds purchased and securities loaned or sold under repurchase agreements	(104)	—	(104)	(1)	—	(1)	(38)	—	(38)
Short-term borrowings <sup>(a)</sup>	(638)	—	(638)	374	—	374	(1,186)	—	(1,186)
Trading liabilities	6	—	6	1	—	1	(1)	—	(1)
Other liabilities	(16)	—	(16)	—	—	—	—	—	—
Long-term debt <sup>(a)(b)</sup>	(2,655)	1 <sup>(c)</sup>	(2,654)	1,272	—	1,272	(969)	—	(969)

- (a) Unrealized gains/(losses) due to instrument-specific credit risk (DVA) for liabilities for which the fair value option has been elected is recorded in OCI, while realized gains/(losses) are recorded in principal transactions revenue. Realized gains/(losses) due to instrument-specific credit risk recorded in principal transactions revenue were not material for the years ended December 31, 2019, 2018 and 2017.
- (b) Long-term debt measured at fair value predominantly relates to structured notes. Although the risk associated with the structured notes is actively managed, the gains/(losses) reported in this table do not include the income statement impact of the risk management instruments used to manage such risk.
- (c) Reported in mortgage fees and related income.
- (d) Changes in fair value exclude contractual interest, which is included in interest income and interest expense for all instruments other than hybrid financial instruments. Refer to Note 8 for further information regarding interest income and interest expense.
- (e) Reported in other income.

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### Determination of instrument-specific credit risk for items for which a fair value election was made

The following describes how the gains and losses that are attributable to changes in instrument-specific credit risk, were determined.

- Loans and lending-related commitments: For floating-rate instruments, all changes in value are attributed to instrument-specific credit risk. For fixed-rate instruments, an allocation of the changes in value for the period is made between those changes in value that are interest rate-related and changes in value that are credit-related. Allocations are generally based on an analysis of borrower-specific credit spread and recovery

information, where available, or benchmarking to similar entities or industries.

- Long-term debt: Changes in value attributable to instrument-specific credit risk were derived principally from observable changes in the Bank's credit spread as observed in the bond market.
- Securities financing agreements: Generally, for these types of agreements, there is a requirement that collateral be maintained with a market value equal to or in excess of the principal amount loaned; as a result, there would be no adjustment or an immaterial adjustment for instrument-specific credit risk related to these agreements.

### 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 and 2018, for loans, long-term debt and long-term beneficial interests for which the fair value option has been elected.

	2019			2018		
	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding
December 31, (in millions)						
<b>Loans<sup>(a)</sup></b>						
<b>Nonaccrual loans</b>						
Loans reported as trading assets	\$ 2,452	\$ 904	\$ (1,548)	\$ 2,794	\$ 1,098	\$ (1,696)
Loans	178	139	(39)	39	–	(39)
<b>Subtotal</b>	<b>2,630</b>	<b>1,043</b>	<b>(1,587)</b>	<b>2,833</b>	<b>1,098</b>	<b>(1,735)</b>
<b>All other performing loans</b>						
Loans reported as trading assets	47,754	47,195	(559)	41,072	40,168	(904)
Loans	7,046	6,965	(81)	3,186	3,151	(35)
<b>Total loans</b>	<b>\$ 57,430</b>	<b>\$ 55,203</b>	<b>\$ (2,227)</b>	<b>\$ 47,091</b>	<b>\$ 44,417</b>	<b>\$ (2,674)</b>
<b>Long-term debt</b>						
Principal-protected debt	\$ 18,063 <sup>(c)</sup>	\$ 18,085	\$ 22	\$ 11,314 <sup>(c)</sup>	\$ 10,903	\$ (411)
Nonprincipal-protected debt <sup>(b)</sup>	NA	22,186	NA	NA	15,650	NA
<b>Total long-term debt</b>	<b>NA</b>	<b>\$ 40,271</b>	<b>NA</b>	<b>NA</b>	<b>\$ 26,553</b>	<b>NA</b>

(a) There were no performing loans that were ninety days or more past due as of December 31, 2019 and 2018.

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

(c) Where the Bank 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 Bank's next call date.

At December 31, 2019 and 2018, the contractual amount of lending-related commitments for which the fair value option was elected was \$4.6 billion and \$6.9 billion, respectively, with a corresponding fair value of \$(94) million and \$(92) million, respectively. Refer to Note 26 for further information regarding off-balance sheet lending-related financial instruments.

## Note 5 - Credit risk concentrations

Concentrations of credit risk arise when a number of clients, counterparties or customers are engaged in similar business activities or activities in the same geographic region, or when they have similar economic features that would cause their ability to meet contractual obligations to be similarly affected by changes in economic conditions.

The Bank regularly monitors various segments of its credit portfolios to assess potential credit risk concentrations and to obtain additional collateral when deemed necessary and permitted under the Bank's agreements. Senior management is significantly involved in the credit approval and review process, and risk levels are adjusted as needed to reflect the Bank's risk appetite.

In the Bank's consumer portfolio, concentrations are managed primarily by product and by U.S. geographic region, with a key focus on trends and concentrations at the portfolio level, where potential credit risk concentrations can be remedied through changes in underwriting policies and portfolio guidelines. Refer to Note 13 for additional information on the geographic composition of the Bank's consumer loan portfolios. In the wholesale portfolio, credit risk concentrations are evaluated primarily by industry and monitored regularly on both an aggregate portfolio level and on an individual client or counterparty basis.

The Bank's wholesale exposure is managed through loan syndications and participations, loan sales, securitizations, credit derivatives, master netting agreements, collateral and other risk-reduction techniques. Refer to Note 13 for additional information on loans.

The Bank does not believe that its exposure to any particular loan product or industry segment (e.g., real estate), or its exposure to residential real estate loans with high LTV ratios, results in a significant concentration of credit risk.

Terms of loan products and collateral coverage are included in the Bank's assessment when extending credit and establishing its allowance for loan losses.

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The table below presents both on-balance sheet and off-balance sheet consumer and wholesale-related credit exposure by the Bank's three credit portfolio segments as of December 31, 2019 and 2018.

December 31, (in millions)	2019				2018			
	Credit exposure <sup>(g)</sup>	On-balance sheet		Off-balance sheet <sup>(h)</sup>	Credit exposure <sup>(g)</sup>	On-balance sheet		Off-balance sheet <sup>(h)</sup>
		Loans	Derivatives			Loans	Derivatives	
<b>Consumer, excluding credit card</b>	\$ 386,309	\$ 334,897	\$ —	\$ 51,412	\$ 419,770	\$ 373,704	\$ —	\$ 46,066
<b>Credit card</b>	819,644	168,924	—	650,720	762,011	156,632	—	605,379
<b>Total consumer-related</b>	<b>1,205,953</b>	<b>503,821</b>	<b>—</b>	<b>702,132</b>	<b>1,181,781</b>	<b>530,336</b>	<b>—</b>	<b>651,445</b>
<b>Wholesale-related<sup>(a)</sup></b>								
Real Estate	149,267	116,244	619	32,404	143,316	115,737	164	27,415
Individuals and Individual Entities <sup>(b)</sup>	101,970	91,662	693	9,615	97,077	86,586	1,016	9,475
Consumer & Retail	99,314	30,863	1,423	67,028	94,783	36,898	1,084	56,801
Technology, Media & Telecommunications	58,821	14,680	2,766	41,375	72,646	16,980	2,667	52,999
Industrials	58,243	19,091	878	38,274	58,522	19,120	958	38,444
Asset Managers	50,860	23,806	7,018	20,036	41,961	16,745	8,658	16,558
Banks & Finance Cos	50,402	30,714	5,401	14,287	50,205	28,825	6,173	15,207
Healthcare	46,271	13,727	2,000	30,544	47,510	15,848	1,805	29,857
Oil & Gas	41,489	13,023	813	27,653	42,533	12,945	556	29,032
Utilities	34,551	5,027	2,428	27,096	27,888	5,532	1,579	20,777
State & Municipal Govt <sup>(c)</sup>	26,211	9,464	1,974	14,773	26,741	9,747	1,963	15,031
Automotive	17,317	5,408	368	11,541	17,338	5,170	398	11,770
Chemicals & Plastics	17,276	4,710	459	12,107	16,034	4,902	180	10,952
Metals & Mining	15,250	5,202	315	9,733	15,247	5,370	377	9,500
Central Govt	14,795	2,818	10,429	1,548	18,412	3,867	12,825	1,720
Transportation	13,903	4,790	715	8,398	15,643	6,375	1,102	8,166
Insurance	12,199	1,267	2,281	8,651	12,633	1,355	2,562	8,716
Securities Firms	6,514	558	4,500	1,456	3,860	532	1,993	1,335
Financial Markets Infrastructure	4,088	9	2,455	1,624	7,397	18	5,854	1,525
All other <sup>(d)</sup>	76,481	50,177	1,860	24,444	68,300	45,217	1,624	21,459
<b>Subtotal</b>	<b>895,222</b>	<b>443,240</b>	<b>49,395</b>	<b>402,587</b>	<b>878,046</b>	<b>437,769</b>	<b>53,538</b>	<b>386,739</b>
Loans held-for-sale and loans at fair value	11,154	11,154	—	—	15,028	15,028	—	—
Receivables from customers and other <sup>(e)</sup>	4,923	—	—	—	2,098	—	—	—
<b>Total wholesale-related</b>	<b>911,299</b>	<b>454,394</b>	<b>49,395</b>	<b>402,587</b>	<b>895,172</b>	<b>452,797</b>	<b>53,538</b>	<b>386,739</b>
<b>Total exposure<sup>(f)(g)</sup></b>	<b>\$ 2,117,252</b>	<b>\$ 958,215</b>	<b>\$ 49,395</b>	<b>\$ 1,104,719</b>	<b>\$ 2,076,953</b>	<b>\$ 983,133</b>	<b>\$ 53,538</b>	<b>\$ 1,038,184</b>

- (a) The industry rankings presented in the table as of December 31, 2018, are based on the industry rankings of the corresponding exposures at December 31, 2019, not actual rankings of such exposures at December 31, 2018.
- (b) Individuals and Individual Entities predominantly consists of wealth management clients and includes exposure to personal investment companies and personal and testamentary trusts.
- (c) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2019 and 2018, noted above, the Bank held: \$4.0 billion and \$4.3 billion, respectively, of trading assets; \$28.8 billion and \$36.2 billion, respectively, of AFS securities; and 4.8 billion at both periods of held-to-maturity ("HTM") securities, issued by U.S. state and municipal governments. Refer to Note 3 and Note 11 for further information.
- (d) All other includes: SPEs and Private education and civic organizations, representing approximately 92% and 8%, respectively, at both December 31, 2019 and 2018. Refer to Note 15 for more information on exposures to SPEs.
- (e) Receivables from customers primarily represent held-for-investment margin loans to brokerage clients that are collateralized by assets maintained in the clients' brokerage accounts (e.g. cash on deposit, liquid and readily marketable debt or equity securities), as such no allowance is held against these receivables. To manage its credit risk the Bank establishes margin requirements and monitors the required margin levels on an ongoing basis, and requires clients to deposit additional cash or other collateral, or to reduce positions, when appropriate. These receivables are reported within accrued interest and accounts receivable on the Bank's Consolidated balance sheets.
- (f) Excludes cash placed with banks of \$252.5 billion and \$266.5 billion, at December 31, 2019 and 2018, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.
- (g) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.
- (h) Represents lending-related financial instruments.

## Note 6 – Derivative instruments

Derivative contracts derive their value from underlying asset prices, indices, reference rates, other inputs or a combination of these factors and may expose counterparties to risks and rewards of an underlying asset or liability without having to initially invest in, own or exchange the asset or liability. The Bank makes markets in derivatives for clients and also uses derivatives to hedge or manage its own risk exposures. Predominantly all of the Bank's derivatives are entered into for market-making or risk management purposes.

### *Market-making derivatives*

The majority of the Bank's derivatives are entered into for market-making purposes. Clients use derivatives to mitigate or modify interest rate, credit, foreign exchange, equity and commodity risks. The Bank actively manages the risks from its exposure to these derivatives by entering into other derivative contracts or by purchasing or selling other financial instruments that partially or fully offset the exposure from client derivatives.

### *Risk management derivatives*

The Bank manages certain market and credit risk exposures using derivative instruments, including derivatives in hedge accounting relationships and other derivatives that are used to manage risks associated with specified assets and liabilities.

The Bank generally uses interest rate derivatives to manage the risk associated with changes in interest rates. Fixed-rate assets and liabilities appreciate or depreciate in market value as interest rates change. Similarly, interest income and expense increase or decrease as a result of variable-rate assets and liabilities resetting to current market rates, and as a result of the repayment and subsequent origination or issuance of fixed-rate assets and liabilities at current market rates. Gains and losses on the derivative instruments related to these assets and liabilities are expected to substantially offset this variability.

Foreign currency derivatives are used to manage the foreign exchange risk associated with certain foreign currency-denominated (i.e., non-U.S. dollar) assets and liabilities and forecasted transactions, as well as the Bank's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. As a result of fluctuations in foreign currencies, the U.S. dollar-equivalent values of the foreign currency-denominated assets and liabilities or the forecasted revenues or expenses increase or decrease. Gains or losses on the derivative instruments related to these foreign currency-denominated assets or liabilities, or forecasted transactions, are expected to substantially offset this variability.

Commodities derivatives are used to manage the price risk of certain commodities inventories. Gains or losses on these derivative instruments are expected to substantially offset the depreciation or appreciation of the related inventory.

Credit derivatives are used to manage the counterparty credit risk associated with loans and lending-related

commitments. Credit derivatives compensate the purchaser when the entity referenced in the contract experiences a credit event, such as bankruptcy or a failure to pay an obligation when due. Credit derivatives primarily consist of CDS. Refer to the discussion in the Credit derivatives section on pages 46–48 of this Note for a further discussion of credit derivatives.

Refer to the risk management derivatives gains and losses table on page 46 of this Note, and the hedge accounting gains and losses tables on pages 43–46 of this Note for more information about risk management derivatives.

### *Derivative counterparties and settlement types*

The Bank enters into OTC derivatives with third parties and JPMorgan Chase affiliates, which are negotiated and settled bilaterally with the derivative counterparty. The Bank also enters into, as principal, certain exchange-traded derivatives (“ETD”) such as futures and options, and “cleared” over-the-counter (“OTC-cleared”) derivative contracts with CCPs. ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is the Bank's counterparty from the inception of the transactions. OTC-cleared derivatives are traded on a bilateral basis and then novated to the CCP for clearing.

### *Derivative clearing services*

The Bank provides clearing services for clients in which the Bank acts as a clearing member at certain derivative exchanges and clearing houses. The Bank does not reflect the clients' derivative contracts in its Consolidated Financial Statements. Refer to Note 26 for further information on the Bank's clearing services.

### **Accounting for derivatives**

All free-standing derivatives that the Bank executes for its own account are required to be recorded on the Consolidated balance sheets at fair value.

As permitted under U.S. GAAP, the Bank nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between the Bank and the derivative counterparty. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. The accounting for changes in value of a derivative depends on whether or not the transaction has been designated and qualifies for hedge accounting. Derivatives that are not designated as hedges are reported and measured at fair value through earnings. The tabular disclosures on pages 39–46 of this Note provide additional information on the amount of, and reporting for, derivative assets, liabilities, gains and losses. Refer to Notes 3 and 4 for further discussion of derivatives embedded in structured notes.

### *Derivatives designated as hedges*

The Bank applies hedge accounting to certain derivatives executed for risk management purposes – generally interest rate, foreign exchange and commodity derivatives. However, the Bank does not seek to apply hedge accounting to all of

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the derivatives involved in its risk management activities. For example, the Bank does not apply hedge accounting to purchased CDS used to manage the credit risk of loans and lending-related commitments, because of the difficulties in qualifying such contracts as hedges. For the same reason, the Bank does not apply hedge accounting to certain interest rate and foreign exchange derivatives used for risk management purposes.

To qualify for hedge accounting, a derivative must be highly effective at reducing the risk associated with the exposure being hedged. In addition, for a derivative to be designated as a hedge, the risk management objective and strategy must be documented. Hedge documentation must identify the derivative hedging instrument, the asset or liability or forecasted transaction and type of risk to be hedged, and how the effectiveness of the derivative is assessed prospectively and retrospectively. To assess effectiveness, the Bank uses statistical methods such as regression analysis, nonstatistical methods such as dollar-value comparisons of the change in the fair value of the derivative to the change in the fair value or cash flows of the hedged item, and qualitative comparisons of critical terms and the evaluation of any changes in those terms. The extent to which a derivative has been, and is expected to continue to be, highly effective at offsetting changes in the fair value or cash flows of the hedged item must be assessed and documented at least quarterly. If it is determined that a derivative is not highly effective at hedging the designated exposure, hedge accounting is discontinued.

There are three types of hedge accounting designations: fair value hedges, cash flow hedges and net investment hedges. The Bank uses fair value hedges primarily to hedge fixed-rate long-term debt, AFS securities and certain commodities inventories. For qualifying fair value hedges, the changes in the fair value of the derivative, and in the value of the hedged item for the risk being hedged, are recognized in earnings. Certain amounts excluded from the assessment of

effectiveness are recorded in OCI and recognized in earnings over the life of the derivative. If the hedge relationship is terminated, then the adjustment to the hedged item continues to be reported as part of the basis of the hedged item, and for benchmark interest rate hedges, is amortized to earnings as a yield adjustment. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item - primarily net interest income and principal transactions revenue.

The Bank uses cash flow hedges primarily to hedge the exposure to variability in forecasted cash flows from floating-rate assets and liabilities and foreign currency-denominated revenue and expense. For qualifying cash flow hedges, changes in the fair value of the derivative are recorded in OCI and recognized in earnings as the hedged item affects earnings. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item - primarily noninterest revenue, net interest income and compensation expense. If the hedge relationship is terminated, then the change in value of the derivative recorded in accumulated other comprehensive income/(loss) ("AOCI") is recognized in earnings when the cash flows that were hedged affect earnings. For hedge relationships that are discontinued because a forecasted transaction is not expected to occur according to the original hedge forecast, any related derivative values recorded in AOCI are immediately recognized in earnings.

The Bank uses net investment hedges to protect the value of the Bank's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. For qualifying net investment hedges, changes in the fair value of the derivatives due to changes in spot foreign exchange rates are recorded in OCI as translation adjustments. Amounts excluded from the assessment of effectiveness are recorded directly in earnings.

The following table outlines the Bank's primary uses of derivatives and the related hedge accounting designation or disclosure category.

Type of Derivative	Use of Derivative	Designation and disclosure	Page reference
Manage specifically identified risk exposures in qualifying hedge accounting relationships:			
• Interest rate	Hedge fixed rate assets and liabilities	Fair value hedge	43
• Interest rate	Hedge floating-rate assets and liabilities	Cash flow hedge	45
• Foreign exchange	Hedge foreign currency-denominated assets and liabilities	Fair value hedge	43
• Foreign exchange	Hedge foreign currency-denominated forecasted revenue and expense	Cash flow hedge	45
• Foreign exchange	Hedge the value of the Bank's investments in non-U.S. dollar functional currency entities	Net investment hedge	46
• Commodity	Hedge commodity inventory	Fair value hedge	43
Manage specifically identified risk exposures not designated in qualifying hedge accounting relationships:			
• Interest rate	Manage the risk associated with mortgage commitments, warehouse loans and MSRs	Specified risk management	46
• Credit	Manage the credit risk associated with wholesale lending exposures	Specified risk management	46
• Interest rate and foreign exchange	Manage the risk associated with certain other specified assets and liabilities	Specified risk management	46
Market-making derivatives and other activities:			
• Various	Market-making and related risk management	Market-making and other	46
• Various	Other derivatives	Market-making and other	46

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### Notional amount of derivative contracts

The following table summarizes the notional amount of derivative contracts outstanding as of December 31, 2019 and 2018.

December 31, (in billions)	Notional amounts <sup>(b)</sup>	
	2019	2018
<b>Interest rate contracts</b>		
Swaps	\$ 21,724	\$ 22,104
Futures and forwards	2,793	3,180
Written options	3,948	4,001
Purchased options	4,366	4,334
<b>Total interest rate contracts</b>	<b>32,831</b>	<b>33,619</b>
<b>Credit derivatives<sup>(a)</sup></b>	<b>1,214</b>	<b>1,473</b>
<b>Foreign exchange contracts</b>		
Cross-currency swaps	3,647	3,581
Spot, futures and forwards	5,609	5,898
Written options	701	836
Purchased options	718	831
<b>Total foreign exchange contracts</b>	<b>10,675</b>	<b>11,146</b>
<b>Equity contracts</b>		
Swaps	561	487
Futures and forwards	125	83
Written options	566	526
Purchased options	549	539
<b>Total equity contracts</b>	<b>1,801</b>	<b>1,635</b>
<b>Commodity contracts</b>		
Swaps	385	368
Spot, futures and forwards	215	158
Written options	144	143
Purchased options	129	126
<b>Total commodity contracts</b>	<b>873</b>	<b>795</b>
<b>Total derivative notional amounts</b>	<b>\$ 47,394</b>	<b>\$ 48,668</b>

(a) Refer to the Credit derivatives discussion on pages 46-48 for more information on volumes and types of credit derivative contracts.

(b) Represents the sum of gross long and gross short notional derivative contracts with third-parties and JPMorgan Chase affiliates. Refer to Note 21 for additional information on related party derivatives.

While the notional amounts disclosed above give an indication of the volume of the Bank's derivatives activity, the notional amounts significantly exceed, in the Bank'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 balance sheets

The tables below include derivative receivables and payables with affiliates on a net basis. Refer to Note 21 for information regarding our derivative activities with affiliates.

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on the Bank's Consolidated balance sheets as of December 31, 2019 and 2018, by accounting designation (e.g., whether the derivatives were designated in qualifying hedge accounting relationships or not) and contract type.

#### Free-standing derivative receivables and payables<sup>(a)</sup>

December 31, 2019 (in millions)	Gross derivative receivables				Gross derivative payables			
	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables <sup>(b)</sup>	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables <sup>(b)</sup>
<b>Trading assets and liabilities</b>								
Interest rate	\$ 332,595	\$ 710	\$ 333,305	\$ 27,213	\$ 306,244	\$ 1	\$ 306,245	\$ 8,448
Credit	14,545	–	14,545	653	14,751	–	14,751	1,569
Foreign exchange	141,675	168	141,843	9,003	147,958	670	148,628	13,129
Equity	57,511	–	57,511	6,629	59,765	–	59,765	11,139
Commodity	24,199	33	24,232	5,897	25,790	4	25,794	6,552
<b>Total fair value of trading assets and liabilities</b>	<b>\$ 570,525</b>	<b>\$ 911</b>	<b>\$ 571,436</b>	<b>\$ 49,395</b>	<b>\$ 554,508</b>	<b>\$ 675</b>	<b>\$ 555,183</b>	<b>\$ 40,837</b>

December 31, 2018 (in millions)	Gross derivative receivables				Gross derivative payables			
	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables <sup>(b)</sup>	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables <sup>(b)</sup>
<b>Trading assets and liabilities</b>								
Interest rate	\$ 277,357	\$ 686	\$ 278,043	\$ 22,885	\$ 251,175	\$ –	\$ 251,175	\$ 6,959
Credit	18,871	–	18,871	359	19,017	–	19,017	1,386
Foreign exchange	168,844	504	169,348	13,426	165,781	372	166,153	12,726
Equity	67,088	–	67,088	10,261	67,874	–	67,874	10,182
Commodity	28,366	247	28,613	6,607	29,717	121	29,838	8,063
<b>Total fair value of trading assets and liabilities</b>	<b>\$ 560,526</b>	<b>\$ 1,437</b>	<b>\$ 561,963</b>	<b>\$ 53,538</b>	<b>\$ 533,564</b>	<b>\$ 493</b>	<b>\$ 534,057</b>	<b>\$ 39,316</b>

(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 Bank 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.

## Notes to consolidated financial statements

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### Derivatives netting

The following tables present, as of December 31, 2019 and 2018, gross and net derivative receivables and payables by contract and settlement type. Derivative receivables and payables, as well as the related cash collateral from the same counterparty, have been netted on the Consolidated balance sheets where the Bank has obtained an appropriate legal opinion with respect to the master netting agreement. Where such a legal opinion has not been either sought or obtained, amounts are not eligible for netting on the Consolidated balance sheets, and those derivative receivables and payables are shown separately in the tables below.

In addition to the cash collateral received and transferred that is presented on a net basis with derivative receivables and payables, the Bank receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with the Bank'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 other Group of Seven Nations ("G7") government securities) and cash collateral held at third-party custodians, which are shown separately as "Collateral not nettable on the Consolidated balance sheets" in the tables below, up to the fair value exposure amount;
- the amount of collateral held or transferred that exceeds the fair value exposure at the individual counterparty level, as of the date presented, which is excluded from the tables below; and
- collateral held or transferred that relates to derivative receivables or payables where an appropriate legal opinion has not been either sought or obtained with respect to the master netting agreement, which is excluded from the tables below.

December 31, (in millions)	2019			2018		
	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables
<b>U.S. GAAP nettable derivative receivables</b>						
<b>Interest rate contracts:</b>						
Over-the-counter ("OTC")	\$ 319,493	\$ (296,646)	\$ 22,847	\$ 268,586	\$ (249,954)	\$ 18,632
OTC-cleared	9,244	(9,190)	54	5,574	(5,069)	505
Exchange-traded <sup>(a)</sup>	347	(258)	89	322	(136)	186
<b>Total interest rate contracts</b>	<b>329,084</b>	<b>(306,094)</b>	<b>22,990</b>	<b>274,482</b>	<b>(255,159)</b>	<b>19,323</b>
<b>Credit contracts:</b>						
OTC	10,414	(10,033)	381	11,448	(11,290)	158
OTC-cleared	3,864	(3,858)	6	7,267	(7,222)	45
<b>Total credit contracts</b>	<b>14,278</b>	<b>(13,891)</b>	<b>387</b>	<b>18,715</b>	<b>(18,512)</b>	<b>203</b>
<b>Foreign exchange contracts:</b>						
OTC	139,644	(132,682)	6,962	165,544	(155,675)	9,869
OTC-cleared	185	(152)	33	235	(226)	9
Exchange-traded <sup>(a)</sup>	10	(6)	4	32	(21)	11
<b>Total foreign exchange contracts</b>	<b>139,839</b>	<b>(132,840)</b>	<b>6,999</b>	<b>165,811</b>	<b>(155,922)</b>	<b>9,889</b>
<b>Equity contracts:</b>						
OTC	44,749	(42,313)	2,436	49,162	(46,506)	2,656
Exchange-traded <sup>(a)</sup>	9,793	(8,569)	1,224	13,695	(10,321)	3,374
<b>Total equity contracts</b>	<b>54,542</b>	<b>(50,882)</b>	<b>3,660</b>	<b>62,857</b>	<b>(56,827)</b>	<b>6,030</b>
<b>Commodity contracts:</b>						
OTC	14,189	(12,403)	1,786	15,794	(13,787)	2,007
OTC-cleared	28	(28)	–	–	–	–
Exchange-traded <sup>(a)</sup>	6,153	(5,903)	250	8,815	(8,218)	597
<b>Total commodity contracts</b>	<b>20,370</b>	<b>(18,334)</b>	<b>2,036</b>	<b>24,609</b>	<b>(22,005)</b>	<b>2,604</b>
<b>Derivative receivables with appropriate legal opinion</b>	<b>558,113</b>	<b>(522,041)</b>	<b>36,072</b> <sup>(d)</sup>	<b>546,474</b>	<b>(508,425)</b>	<b>38,049</b> <sup>(d)</sup>
<b>Derivative receivables where an appropriate legal opinion has not been either sought or obtained</b>	<b>13,323</b>		<b>13,323</b>	<b>15,489</b>		<b>15,489</b>
<b>Total derivative receivables recognized on the Consolidated balance sheets</b>	<b>\$ 571,436</b>		<b>\$ 49,395</b>	<b>\$ 561,963</b>		<b>\$ 53,538</b>
<b>Collateral not nettable on the Consolidated balance sheets</b> <sup>(b)(c)</sup>			<b>(14,178)</b>			<b>(12,821)</b>
<b>Net amounts</b>			<b>\$ 35,217</b>			<b>\$ 40,717</b>

December 31, (in millions)	2019			2018		
	Gross derivative payables	Amounts netted on the Consolidated balance sheets	Net derivative payables	Gross derivative payables	Amounts netted on the Consolidated balance sheets	Net derivative payables
<b>U.S. GAAP nettable derivative payables</b>						
<b>Interest rate contracts:</b>						
OTC	\$ 294,595	\$ (287,526)	\$ 7,069	\$ 243,338	\$ (238,374)	\$ 4,964
OTC-cleared	10,047	(9,968)	79	6,375	(5,706)	669
Exchange-traded <sup>(a)</sup>	365	(303)	62	210	(135)	75
<b>Total interest rate contracts</b>	<b>305,007</b>	<b>(297,797)</b>	<b>7,210</b>	<b>249,923</b>	<b>(244,215)</b>	<b>5,708</b>
<b>Credit contracts:</b>						
OTC	11,201	(9,794)	1,407	12,156	(10,918)	1,238
OTC-cleared	3,390	(3,389)	1	6,716	(6,714)	2
<b>Total credit contracts</b>	<b>14,591</b>	<b>(13,183)</b>	<b>1,408</b>	<b>18,872</b>	<b>(17,632)</b>	<b>1,240</b>
<b>Foreign exchange contracts:</b>						
OTC	145,897	(135,340)	10,557	161,889	(153,156)	8,733
OTC-cleared	186	(152)	34	274	(268)	6
Exchange-traded <sup>(a)</sup>	12	(6)	6	17	(3)	14
<b>Total foreign exchange contracts</b>	<b>146,095</b>	<b>(135,498)</b>	<b>10,597</b>	<b>162,180</b>	<b>(153,427)</b>	<b>8,753</b>
<b>Equity contracts:</b>						
OTC	45,876	(40,061)	5,815	51,253	(47,341)	3,912
Exchange-traded <sup>(a)</sup>	8,959	(8,565)	394	11,147	(10,351)	796
<b>Total equity contracts</b>	<b>54,835</b>	<b>(48,626)</b>	<b>6,209</b>	<b>62,400</b>	<b>(57,692)</b>	<b>4,708</b>
<b>Commodity contracts:</b>						
OTC	15,671	(13,350)	2,321	17,545	(13,567)	3,978
OTC-cleared	30	(30)	—	—	—	—
Exchange-traded <sup>(a)</sup>	6,007	(5,862)	145	8,248	(8,208)	40
<b>Total commodity contracts</b>	<b>21,708</b>	<b>(19,242)</b>	<b>2,466</b>	<b>25,793</b>	<b>(21,775)</b>	<b>4,018</b>
<b>Derivative payables with appropriate legal opinion</b>	<b>542,236</b>	<b>(514,346)</b>	<b>27,890</b> <sup>(d)</sup>	<b>519,168</b>	<b>(494,741)</b>	<b>24,427</b> <sup>(d)</sup>
<b>Derivative payables where an appropriate legal opinion has not been either sought or obtained</b>	<b>12,947</b>		<b>12,947</b>	<b>14,889</b>		<b>14,889</b>
<b>Total derivative payables recognized on the Consolidated balance sheets</b>	<b>\$ 555,183</b>		<b>\$ 40,837</b>	<b>\$ 534,057</b>		<b>\$ 39,316</b>
<b>Collateral not nettable on the Consolidated balance sheets<sup>(b)(c)</sup></b>			<b>(7,896)</b>			<b>(4,431)</b>
<b>Net amounts</b>			<b>\$ 32,941</b>			<b>\$ 34,885</b>

(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 receivables and derivative payables balances. Where this is the case, the total amount reported is limited to the net derivative receivables and net derivative payables balances with that counterparty.

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

(d) Net derivatives receivable included cash collateral netted of \$69.3 billion and \$56.8 billion at December 31, 2019 and 2018, respectively. Net derivatives payable included cash collateral netted of \$61.6 billion and \$43.1 billion at December 31, 2019 and 2018, respectively. Derivative cash collateral relates to OTC and OTC-cleared derivative instruments.

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### Liquidity risk and credit-related contingent features

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

While derivative receivables expose the Bank to credit risk, derivative payables expose the Bank to liquidity risk, as the derivative contracts typically require the Bank to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor or upon specified downgrades in the Bank's and its subsidiaries' respective credit ratings. Certain derivative contracts also provide for termination of the contract, generally upon a downgrade of either the Bank or the counterparty, at the fair value of the derivative contracts. The following table shows the aggregate fair value of net derivative payables related to OTC and OTC-cleared derivatives that contain contingent collateral or termination features that may be triggered upon a ratings downgrade, and the associated collateral the Bank has posted in the normal course of

business, at December 31, 2019 and 2018.

### OTC and OTC-cleared derivative payables containing downgrade triggers

December 31, (in millions)	2019	2018
Aggregate fair value of net derivative payables	\$ 14,655	\$ 9,198
Collateral posted	13,319	8,881

The following table shows the impact of a single-notch and two-notch downgrade of the long-term issuer ratings of the Bank and its subsidiaries at December 31, 2019 and 2018, related to OTC and OTC-cleared derivative contracts with contingent collateral or termination features that may be triggered upon a ratings downgrade. Derivatives contracts generally require additional collateral to be posted or terminations to be triggered when the predefined threshold rating is breached. A downgrade by a single rating agency that does not result in a rating lower than a preexisting corresponding rating provided by another major rating agency will generally not result in additional collateral (except in certain instances in which additional initial margin may be required upon a ratings downgrade), nor in termination payments requirements. The liquidity impact in the table is calculated based upon a downgrade below the lowest current rating of the rating agencies referred to in the derivative contract.

### Liquidity impact of downgrade triggers on OTC and OTC-cleared derivatives

December 31, (in millions)	2019		2018	
	Single-notch downgrade	Two-notch downgrade	Single-notch downgrade	Two-notch downgrade
Amount of additional collateral to be posted upon downgrade <sup>(a)</sup>	\$ 189	\$ 1,467	\$ 76	\$ 940
Amount required to settle contracts with termination triggers upon downgrade <sup>(b)</sup>	104	1,395	172	764

(a) Includes the additional collateral to be posted for initial margin.

(b) Amounts represent fair values of derivative payables, and do not reflect collateral posted.

### Derivatives executed in contemplation of a sale of the underlying financial asset

In certain instances the Bank enters into transactions in which it transfers financial assets but maintains the economic exposure to the transferred assets by entering into a derivative with the same counterparty in contemplation of the initial transfer. The Bank generally accounts for such transfers as collateralized financing transactions as described in Note 12, but in limited circumstances they may qualify to be accounted for as a sale and a derivative under U.S. GAAP. The amount of such transfers accounted for as a sale where the associated derivative was outstanding was not material at both December 31, 2019 and 2018.

## Impact of derivatives on the Consolidated statements of income

The following tables provide information related to gains and losses recorded on derivatives based on their hedge accounting designation or purpose. Refer to Note 21 for information regarding our derivative activities with affiliates.

### Fair value hedge gains and losses

The following tables present derivative instruments, by contract type, used in fair value hedge accounting relationships, as well as pre-tax gains/(losses) recorded on such derivatives and the related hedged items for the years ended December 31, 2019, 2018 and 2017, respectively. The Bank includes gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the related hedged item.

Year ended December 31, 2019 (in millions)	Gains/(losses) recorded in income			Income statement impact of excluded components <sup>(f)</sup>		OCI impact
	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI <sup>(g)</sup>
<b>Contract type</b>						
Interest rate <sup>(a)(b)</sup>	\$ (3,255)	\$ 3,067	\$ (188)	\$ —	\$ (204)	\$ —
Foreign exchange <sup>(c)</sup>	531	(49)	482	—	482	—
Commodity <sup>(d)</sup>	(242)	244	2	—	1	—
<b>Total</b>	<b>\$ (2,966)</b>	<b>\$ 3,262</b>	<b>\$ 296</b>	<b>\$ —</b>	<b>\$ 279</b>	<b>\$ —</b>

Year ended December 31, 2018 (in millions)	Gains/(losses) recorded in income			Income statement impact of excluded components <sup>(f)</sup>		OCI impact
	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI <sup>(g)</sup>
<b>Contract type</b>						
Interest rate <sup>(a)(b)</sup>	\$ 516	\$ (624)	\$ (108)	\$ —	\$ (105)	\$ —
Foreign exchange <sup>(c)</sup>	1,937	(1,461)	476	(35)	476	1
Commodity <sup>(d)</sup>	(21)	11	(10)	—	(10)	—
<b>Total</b>	<b>\$ 2,432</b>	<b>\$ (2,074)</b>	<b>\$ 358</b>	<b>\$ (35)</b>	<b>\$ 361</b>	<b>\$ 1</b>

Year ended December 31, 2017 (in millions)	Gains/(losses) recorded in income			Income statement impact due to:	
	Derivatives	Hedged items	Income statement impact	Hedge ineffectiveness <sup>(e)</sup>	Excluded components <sup>(f)</sup>
<b>Contract type</b>					
Interest rate <sup>(a)(b)</sup>	\$ 52	\$ (253)	\$ (201)	\$ 2	\$ (203)
Foreign exchange <sup>(c)</sup>	(3,159)	3,523	364	—	364
Commodity <sup>(d)</sup>	(85)	96	11	—	11
<b>Total</b>	<b>\$ (3,192)</b>	<b>\$ 3,366</b>	<b>\$ 174</b>	<b>\$ 2</b>	<b>\$ 172</b>

- (a) Primarily consists of hedges of the benchmark (e.g., London Interbank Offered Rate (“LIBOR”)) interest rate risk of fixed-rate long-term debt and AFS securities. Gains and losses were recorded in net interest income.
- (b) Excludes the amortization expense associated with the inception hedge accounting adjustment applied to the hedged item. This expense is recorded in net interest income and substantially offsets the income statement impact of the excluded components. Also excludes the accrual of interest on interest rate swaps and the related hedged items.
- (c) Primarily consists of hedges of the foreign currency risk of AFS securities for changes in spot foreign currency rates. Gains and losses related to the derivatives and the hedged items due to changes in foreign currency rates and the income statement impact of excluded components were recorded primarily in principal transactions revenue and net interest income.
- (d) Consists of overall fair value hedges of physical commodities inventories that are generally carried at the lower of cost or net realizable value (net realizable value approximates fair value). Gains and losses were recorded in principal transactions revenue.
- (e) Hedge ineffectiveness is the amount by which the gain or loss on the designated derivative instrument does not exactly offset the gain or loss on the hedged item attributable to the hedged risk.
- (f) The assessment of hedge effectiveness excludes certain components of the changes in fair values of the derivatives and hedged items such as forward points on foreign exchange forward contracts, time values and cross-currency basis spreads. Excluded components may impact earnings either through amortization of the initial amount over the life of the derivative or through fair value changes recognized in the current period.
- (g) Represents the change in value of amounts excluded from the assessment of effectiveness under the amortization approach, predominantly cross-currency basis spreads. The amount excluded at inception of the hedge is recognized in earnings over the life of the derivative.

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As of December 31, 2019, the following amounts were recorded on the Consolidated balance sheets related to certain cumulative fair value hedge basis adjustments that are expected to reverse through the income statement in future periods as an adjustment to yield.

December 31, 2019 (in millions)	Carrying amount of the hedged items <sup>(a)(b)</sup>	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items:		
		Active hedging relationships	Discontinued hedging relationships <sup>(d)</sup>	Total
<b>Assets</b>				
Investment securities - AFS	\$ 125,779 <sup>(c)</sup>	\$ 2,110	\$ 278	\$ 2,388
<b>Liabilities</b>				
Long-term debt	\$ 1,058	\$ 183	\$ (8)	\$ 175

December 31, 2018 (in millions)	Carrying amount of the hedged items <sup>(a)(b)</sup>	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items:		
		Active hedging relationships	Discontinued hedging relationships <sup>(d)</sup>	Total
<b>Assets</b>				
Investment securities - AFS	\$ 55,207 <sup>(c)</sup>	\$ (1,105)	\$ 381	\$ (724)
<b>Liabilities</b>				
Long-term debt	\$ 2,021	\$ 160	\$ (12)	\$ 148

- (a) Excludes physical commodities with a carrying value of \$1.5 billion and \$500 million at December 31, 2019 and 2018, respectively, to which the Bank applies fair value hedge accounting. As a result of the application of hedge accounting, these inventories are carried at fair value, thus recognizing unrealized gains and losses in current periods. Since the Bank exits these positions at fair value, there is no incremental impact to net income in future periods.
- (b) Excludes hedged items where only foreign currency risk is the designated hedged risk, as basis adjustments related to foreign currency hedges will not reverse through the income statement in future periods. At December 31, 2019 and 2018, the carrying amount excluded for available-for-sale securities is \$14.9 billion and \$14.6 billion, respectively.
- (c) Carrying amount represents the amortized cost.
- (d) Represents hedged items no longer designated in qualifying fair value hedging relationships for which an associated basis adjustment exists at the balance sheet date.

### Cash flow hedge gains and losses

The following tables present derivative instruments, by contract type, used in cash flow hedge accounting relationships, and the pre-tax gains/(losses) recorded on such derivatives, for the years ended December 31, 2019, 2018 and 2017, respectively. The Bank includes the gain/(loss) on the hedging derivative in the same line item in the Consolidated statements of income as the change in cash flows on the related hedged item.

Year ended December 31, 2019 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
<b>Contract type</b>			
Interest rate <sup>(a)</sup>	\$ (28)	\$ (3)	\$ 25
Foreign exchange <sup>(b)</sup>	(74)	121	195
<b>Total</b>	<b>\$ (102)</b>	<b>\$ 118</b>	<b>\$ 220</b>

Year ended December 31, 2018 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
<b>Contract type</b>			
Interest rate <sup>(a)</sup>	\$ 43	\$ (42)	\$ (85)
Foreign exchange <sup>(b)</sup>	(26)	(201)	(175)
<b>Total</b>	<b>\$ 17</b>	<b>\$ (243)</b>	<b>\$ (260)</b>

Year ended December 31, 2017 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI <sup>(c)</sup>	Total change in OCI for period
<b>Contract type</b>			
Interest rate <sup>(a)</sup>	\$ (17)	\$ 12	\$ 29
Foreign exchange <sup>(b)</sup>	(117)	135	252
<b>Total</b>	<b>\$ (134)</b>	<b>\$ 147</b>	<b>\$ 281</b>

- (a) Primarily consists of hedges of LIBOR-indexed floating-rate assets and floating-rate liabilities. Gains and losses were recorded in net interest income.
- (b) Primarily consists of hedges of the foreign currency risk of non-U.S. dollar-denominated revenue and expense. The income statement classification of gains and losses follows the hedged item - primarily noninterest revenue and compensation expense.
- (c) Represents the effective portion of changes in value of the related hedging derivative. Hedge ineffectiveness is the amount by which the cumulative gain or loss on the designated derivative instrument exceeds the present value of the cumulative expected change in cash flows on the hedged item attributable to the hedged risk. The Bank did not recognize any ineffectiveness on cash flow hedges during 2017.

The Bank did not experience any forecasted transactions that failed to occur for the years ended 2019, 2018 and 2017.

Over the next 12 months, the Bank expects that approximately \$(8) million (after-tax) of net losses recorded in AOCI at December 31, 2019, related to cash flow hedges will be recognized in income. For cash flow hedges that have been terminated, the maximum length of time over which the derivative results recorded in AOCI will be recognized in earnings is approximately five years, corresponding to the timing of the originally hedged forecasted cash flows. For open cash flow hedges, the maximum length of time over which forecasted transactions are hedged is approximately seven years. The Bank's longer-dated forecasted transactions relate to core lending and borrowing activities.

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### Net investment hedge gains and losses

The following table presents hedging instruments, by contract type, that were used in net investment hedge accounting relationships, and the pre-tax gains/(losses) recorded on such instruments for the years ended December 31, 2019, 2018 and 2017.

Year ended December 31, (in millions)	2019		2018		2017	
	Amounts recorded in income <sup>(a)(b)</sup>	Amounts recorded in OCI	Amounts recorded in income <sup>(a)(b)</sup>	Amounts recorded in OCI	Amounts recorded in income <sup>(a)(b)</sup>	Amounts recorded in OCI <sup>(c)</sup>
Foreign exchange derivatives	\$ 56	\$ 130	\$ (19)	\$ 941	\$ (172)	\$ (847)

- (a) Certain components of hedging derivatives are permitted to be excluded from the assessment of hedge effectiveness, such as forward points on foreign exchange forward contracts. The Bank elects to record changes in fair value of these amounts directly in other income.
- (b) Excludes amounts reclassified from AOCI to income on the sale or liquidation of hedged entities. The Bank reclassified net pre-tax gains/(losses) of \$4 million to other income and \$(23) million to other expense related to the liquidation of certain legal entities during the years ended December 31, 2019 and 2018, respectively. During the year ended December 31, 2017, the amount of such reclassifications were not material. Refer to Note 22 for further information.
- (c) Represents the effective portion of changes in value of the related hedging derivative. The Bank did not recognize any ineffectiveness on net investment hedges directly in income during 2017.

### Gains and losses on derivatives used for specified risk management purposes

The following table presents pre-tax gains/(losses) recorded on a limited number of derivatives, not designated in hedge accounting relationships, that are used to manage risks associated with certain specified assets and liabilities, including certain risks arising from mortgage commitments, warehouse loans, MSRs, wholesale lending exposures, and foreign currency denominated assets and liabilities.

Year ended December 31, (in millions)	Derivatives gains/(losses) recorded in income		
	2019	2018	2017
<b>Contract type</b>			
Interest rate <sup>(a)</sup>	\$ 1,502	\$ 79	\$ 331
Credit <sup>(b)</sup>	(41)	(21)	(74)
Foreign exchange <sup>(c)</sup>	(32)	152	(98)
<b>Total</b>	<b>\$ 1,429</b>	<b>\$ 210</b>	<b>\$ 159</b>

- (a) Primarily represents interest rate derivatives used to hedge the interest rate risk inherent in mortgage commitments, warehouse loans and MSRs, as well as written commitments to originate warehouse loans. Gains and losses were recorded predominantly in mortgage fees and related income.
- (b) Relates to credit derivatives used to mitigate credit risk associated with lending exposures in the Bank's wholesale businesses. These derivatives do not include credit derivatives used to mitigate counterparty credit risk arising from derivative receivables, which is included in gains and losses on derivatives related to market-making activities and other derivatives. Gains and losses were recorded in principal transactions revenue.
- (c) Primarily relates to derivatives used to mitigate foreign exchange risk of specified foreign currency-denominated assets and liabilities. Gains and losses were recorded in principal transactions revenue.

### Gains and losses on derivatives related to market-making activities and other derivatives

The Bank makes markets in derivatives in order to meet the needs of customers and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. All derivatives not included in the hedge accounting or specified risk management categories above are included in this category. Gains and losses on these derivatives are primarily recorded in principal transactions revenue. Refer to Note 7 for information on principal transactions revenue.

### Credit derivatives

Credit derivatives are financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) and which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Credit derivatives expose the protection purchaser to the creditworthiness of the protection seller, as the protection seller is required to make payments under the contract when the reference entity experiences a credit event, such as a bankruptcy, a failure to pay its obligation or a restructuring. The seller of credit protection receives a premium for providing protection but has the risk that the underlying instrument referenced in the contract will be subject to a credit event.

The Bank is both a purchaser and seller of protection in the credit derivatives market and uses these derivatives for two primary purposes. First, in its capacity as a market-maker, the Bank actively manages a portfolio of credit derivatives by purchasing and selling credit protection, predominantly on corporate debt obligations, to meet the needs of customers. Second, as an end-user, the Bank uses credit derivatives to manage credit risk associated with lending exposures (loans and unfunded commitments) and derivatives counterparty exposures in the Bank's wholesale businesses, and to manage the credit risk arising from certain financial instruments in the Bank's market-making businesses. Following is a summary of various types of credit derivatives.

### *Credit default swaps*

Credit derivatives may reference the credit of either a single reference entity (“single-name”) or a broad-based index. The Bank purchases and sells protection on both single-name and index-reference obligations. Single-name CDS and index CDS contracts are either OTC or OTC-cleared derivative contracts. Single-name CDS are used to manage the default risk of a single reference entity, while index CDS contracts are used to manage the credit risk associated with the broader credit markets or credit market segments. Like the S&P 500 and other market indices, a CDS index consists of a portfolio of CDS across many reference entities. New series of CDS indices are periodically established with a new underlying portfolio of reference entities to reflect changes in the credit markets. If one of the reference entities in the index experiences a credit event, then the reference entity that defaulted is removed from the index. CDS can also be referenced against specific portfolios of reference names or against customized exposure levels based on specific client demands: for example, to provide protection against the first \$1 million of realized credit losses in a \$10 million portfolio of exposure. Such structures are commonly known as tranche CDS.

For both single-name CDS contracts and index CDS contracts, upon the occurrence of a credit event, under the terms of a CDS contract neither party to the CDS contract has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value of the reference obligation at settlement of the credit derivative contract, also known as the recovery value. The protection purchaser does not need to hold the debt instrument of the underlying reference entity in order to receive amounts due under the CDS contract when a credit event occurs.

### *Credit-related notes*

A credit-related note is a funded credit derivative where the issuer of the credit-related note purchases from the note investor credit protection on a reference entity or an index. Under the contract, the investor pays the issuer the par value of the note at the inception of the transaction, and in return, the issuer pays periodic payments to the investor, based on the credit risk of the referenced entity. The issuer also repays the investor the par value of the note at maturity unless the reference entity (or one of the entities that makes up a reference index) experiences a specified credit event. If a credit event occurs, the issuer is not obligated to repay the par value of the note, but rather, the issuer pays the investor the difference between the par value of the note and the fair value of the defaulted reference obligation at the time of settlement. Neither party to the credit-related note has recourse to the defaulting reference entity.

The following tables present a summary of the notional amounts of credit derivatives and credit-related notes the Bank sold and purchased as of December 31, 2019 and 2018. Upon a credit event, the Bank as a seller of protection would typically pay out only a percentage of the full notional amount of net protection sold, as the amount actually required to be paid on the contracts takes into account the recovery value of the reference obligation at the time of settlement. The Bank manages the credit risk on contracts to sell protection by purchasing protection with identical or similar underlying reference entities. Other purchased protection referenced in the following tables includes credit derivatives bought on related, but not identical, reference positions (including indices, portfolio coverage and other reference points) as well as protection purchased through credit-related notes.

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The Bank does not use notional amounts of credit derivatives as the primary measure of risk management for such derivatives, because the notional amount does not take into account the probability of the occurrence of a credit event, the recovery value of the reference obligation, or related cash instruments and economic hedges, each of which reduces, in the Bank's view, the risks associated with such derivatives.

### Total credit derivatives and credit-related notes

December 31, 2019 (in millions)	Maximum payout/Notional amount			
	Protection sold	Protection purchased with identical underlyings <sup>(b)</sup>	Net protection (sold)/purchased <sup>(c)</sup>	Other protection purchased <sup>(d)</sup>
<b>Credit derivatives</b>				
Credit default swaps	\$ (547,953)	\$ 556,560	\$ 8,607	\$ 3,846
Other credit derivatives <sup>(a)</sup>	(45,090)	53,507	8,417	6,964
<b>Total credit derivatives</b>	<b>(593,043)</b>	<b>610,067</b>	<b>17,024</b>	<b>10,810</b>
Credit-related notes	—	—	—	9,590
<b>Total</b>	<b>\$ (593,043)</b>	<b>\$ 610,067</b>	<b>\$ 17,024</b>	<b>\$ 20,400</b>

December 31, 2018 (in millions)	Maximum payout/Notional amount			
	Protection sold	Protection purchased with identical underlyings <sup>(b)</sup>	Net protection (sold)/purchased <sup>(c)</sup>	Other protection purchased <sup>(d)</sup>
<b>Credit derivatives</b>				
Credit default swaps	\$ (680,487)	\$ 689,761	\$ 9,274	\$ 3,712
Other credit derivatives <sup>(a)</sup>	(44,110)	46,087	1,977	8,488
<b>Total credit derivatives</b>	<b>(724,597)</b>	<b>735,848</b>	<b>11,251</b>	<b>12,200</b>
Credit-related notes	—	—	—	8,338
<b>Total</b>	<b>\$ (724,597)</b>	<b>\$ 735,848</b>	<b>\$ 11,251</b>	<b>\$ 20,538</b>

(a) Other credit derivatives predominantly consist of credit swap options and total return swaps.

(b) Represents the total notional amount of protection purchased where the underlying reference instrument is identical to the reference instrument on protection sold; the notional amount of protection purchased for each individual identical underlying reference instrument may be greater or lower than the notional amount of protection sold.

(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 Bank on referenced instruments (single-name, portfolio or index) where the Bank has not sold any protection on the identical reference instrument.

The following tables summarize the notional amounts by the ratings, maturity profile, and total fair value, of credit derivatives and credit-related notes as of December 31, 2019 and 2018, where the Bank 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 and credit-related notes where the Bank is the purchaser of protection are comparable to the profile reflected below.

### Protection sold - credit derivatives and credit-related notes ratings<sup>(a)</sup>/maturity profile

December 31, 2019 (in millions)	<1 year	1-5 years	>5 years	Total notional amount	Fair value of receivables <sup>(b)</sup>	Fair value of payables <sup>(b)</sup>	Net fair value
<b>Risk rating of reference entity</b>							
Investment-grade	\$ (114,640)	\$ (311,433)	\$ (31,690)	\$ (457,763)	\$ 6,078	\$ (820)	\$ 5,258
Noninvestment-grade	(41,661)	(87,705)	(5,914)	(135,280)	4,270	(2,737)	1,533
<b>Total</b>	<b>\$ (156,301)</b>	<b>\$ (399,138)</b>	<b>\$ (37,604)</b>	<b>\$ (593,043)</b>	<b>\$ 10,348</b>	<b>\$ (3,557)</b>	<b>\$ 6,791</b>

December 31, 2018 (in millions)	<1 year	1-5 years	>5 years	Total notional amount	Fair value of receivables <sup>(b)</sup>	Fair value of payables <sup>(b)</sup>	Net fair value
<b>Risk rating of reference entity</b>							
Investment-grade	\$ (118,135)	\$ (402,501)	\$ (32,585)	\$ (553,221)	\$ 5,750	\$ (2,390)	\$ 3,360
Noninvestment-grade	(45,897)	(119,316)	(6,163)	(171,376)	4,718	(4,820)	(102)
<b>Total</b>	<b>\$ (164,032)</b>	<b>\$ (521,817)</b>	<b>\$ (38,748)</b>	<b>\$ (724,597)</b>	<b>\$ 10,468</b>	<b>\$ (7,210)</b>	<b>\$ 3,258</b>

(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 Bank.

## Note 7 – Noninterest revenue and noninterest expense

### Noninterest revenue

The Bank records noninterest revenue from certain contracts with customers in investment banking fees, deposit-related fees, asset management, administration, and commissions, and components of card income. The related contracts are often terminable on demand and the Bank has no remaining obligation to deliver future services. For arrangements with a fixed term, the Bank may commit to deliver services in the future. Revenue associated with these remaining performance obligations typically depends on the occurrence of future events or underlying asset values, and is not recognized until the outcome of those events or values are known.

### Investment banking fees

This revenue category includes debt and equity underwriting and advisory fees. As an underwriter, the Bank helps clients raise capital via public offering and private placement of various types of debt and equity instruments. Underwriting fees are primarily based on the issuance price and quantity of the underlying instruments, and are recognized as revenue typically upon execution of the client's transaction. The Bank also manages and syndicates loan arrangements. Credit arrangement and syndication fees, included within debt underwriting fees, are recorded as revenue after satisfying certain retention, timing and yield criteria.

The Bank also provides advisory services, by assisting its clients with mergers and acquisitions, divestitures, restructuring and other complex transactions. Advisory fees are recognized as revenue typically upon execution of the client's transaction.

The following table presents the components of investment banking fees.

Year ended December 31, (in millions)	2019	2018	2017
<b>Underwriting</b>			
Equity	\$ 439	\$ 488	\$ 540
Debt	1,914	1,993	2,136
<b>Total underwriting</b>	<b>2,353</b>	<b>2,481</b>	<b>2,676</b>
Advisory	864	887	743
<b>Total investment banking fees</b>	<b>\$ 3,217</b>	<b>\$ 3,368</b>	<b>\$ 3,419</b>

### Principal transactions

Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Bank and the price at which another market participant is willing and able to buy it from the Bank, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities, and on private equity investments.
  - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
  - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Bank transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk

Refer to Note 6 for further information on the income statement classification of gains and losses from derivatives activities.

In the financial commodity markets, the Bank transacts in OTC derivatives (e.g., swaps, forwards, options) and ETD that reference a wide range of underlying commodities. In the physical commodity markets, the Bank primarily purchases and sells precious metals.

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The following table presents all realized and unrealized gains and losses recorded in principal transactions revenue. This table excludes interest income and interest expense on trading assets and liabilities, which are an integral part of the overall performance of the Bank's client-driven market-making activities and cash deployment activities. Refer to Note 8 for further information on interest income and interest expense.

Trading revenue is presented primarily by instrument type. The Bank's client-driven market-making activities generally utilize a variety of instrument types in connection with their market-making and related risk-management activities; accordingly, the trading revenue presented in the table below is not representative of the total revenue of the Bank's client-driven market making activities.

Year ended December 31, (in millions)	2019	2018	2017
<b>Trading revenue by instrument type</b>			
Interest rate	\$ 2,347	\$ 2,779	\$ 3,200
Credit	985	910	653
Foreign exchange	3,211	3,618	2,829
Equity	4,279	3,916	2,784
Commodity	741	600	415
<b>Total trading revenue</b>	<b>11,563</b>	<b>11,823</b>	<b>9,881</b>
Private equity gains/(losses)	1	(9)	2
<b>Principal transactions</b>	<b>\$ 11,564</b>	<b>\$ 11,814</b>	<b>\$ 9,883</b>

### Lending- and deposit-related fees

Lending-related fees include fees earned from loan commitments, standby letters of credit, financial guarantees, and other loan-servicing activities. Deposit-related fees include fees earned in lieu of compensating balances, and fees earned from performing cash management activities and other deposit account services. Lending- and deposit-related fees in this revenue category are recognized over the period in which the related service is provided.

The following table presents the components of lending- and deposit-related fees.

Year ended December 31, (in millions)	2019	2018	2017
Lending-related fees	\$ 1,183	\$ 1,122	\$ 1,118
Deposit-related fees	5,185	4,935	4,823
<b>Total lending- and deposit-related fees</b>	<b>\$ 6,368</b>	<b>\$ 6,057</b>	<b>\$ 5,941</b>

### Asset management, administration and commissions

This revenue category includes fees from investment management and related services, custody, brokerage services and other products. The Bank manages assets on behalf of its clients, including investors in Bank-sponsored funds and owners of separately managed investment accounts. Management fees are typically based on the value of assets under management and are collected and recognized at the end of each period over which the management services are provided and the value of the managed assets is known. The Bank also receives performance-based management fees, which are earned based on exceeding certain benchmarks or other performance targets and are accrued and recognized when the probability of reversal is remote, typically at the end of the related billing period. The Bank has contractual arrangements with third parties to provide distribution and other services in connection with its asset management activities. Amounts paid to these third-party service providers are generally recorded in professional and outside services expense.

The following table presents the components of the Bank asset management, administration and commissions.

Year ended December 31, (in millions)	2019	2018	2017
<b>Asset management fees</b>			
Investment management fees <sup>(a)</sup>	\$ 2,043	\$ 2,049	\$ 2,039
All other asset management fees	46	53	54
<b>Total asset management fees</b>	<b>2,089</b>	<b>2,102</b>	<b>2,093</b>
Total administration fees <sup>(b)</sup>	2,193	2,177	2,026
<b>Commissions and other fees</b>			
Brokerage commissions <sup>(c)</sup>	1,254	1,284	1,115
All other commissions and fees <sup>(d)</sup>	6,441	5,466	5,124
<b>Total commissions and fees</b>	<b>7,695</b>	<b>6,750</b>	<b>6,239</b>
<b>Total asset management, administration and commissions</b>	<b>\$ 11,977</b>	<b>\$ 11,029</b>	<b>\$ 10,358</b>

- (a) Represents fees earned from managing assets on behalf of the Bank's clients, including investors in Bank-sponsored funds and owners of separately managed investment accounts.
- (b) Predominantly includes fees for custody, securities lending, funds services and securities clearance. These fees are recorded as revenue over the period in which the related service is provided.
- (c) Represents commissions earned when the Bank acts as a broker, by facilitating its clients' purchases and sales of securities and other financial instruments. Brokerage commissions are collected and recognized as revenue upon occurrence of the client transaction. The Bank reports certain costs paid to third-party clearing houses and exchanges net against commission revenue.
- (d) Includes fees earned for services provided to affiliates. Refer to Note 21 for discussion of service agreements and fee arrangements.

In addition, included in all other commissions and fees are fees earned by the Bank for providing operational support and services to JPMorgan Chase and its subsidiaries. Refer to Note 21 for further information on related party transactions.

### Mortgage fees and related income

This revenue category primarily reflects net production and net mortgage servicing revenue.

Net production revenue includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Net production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option.

Net mortgage servicing revenue includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

Refer to Note 16 for further information on risk management activities and MSRs.

Net interest income from mortgage loans is recorded in interest income.

### Card income

This revenue category includes interchange and other income from credit and debit card transactions, and fees earned from processing card transactions for merchants, both of which are recognized when purchases are made by a cardholder and presented net of certain transaction-related costs. Card income also includes account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

Certain credit card products offer the cardholder the ability to earn points based on account activity, which the cardholder can choose to redeem for cash and non-cash rewards. The cost to the Bank related to these proprietary rewards programs varies based on multiple factors including the terms and conditions of the rewards programs, cardholder activity, cardholder reward redemption rates and cardholder reward selections. The Bank maintains a liability for its obligations under its rewards programs and reports the current-period cost as a reduction of card income.

### Credit card revenue sharing agreements

The Bank has contractual agreements with numerous co-brand partners that grant the Bank exclusive rights to issue co-branded credit card products and market them to the customers of such partners. These partners endorse the co-brand credit card programs and provide their customer or member lists to the Bank. The partners may also conduct marketing activities and provide rewards redeemable under their own loyalty programs that the Bank will grant to co-brand credit cardholders based on account activity. The terms of these agreements generally range from five to ten years.

The Bank typically makes payments to the co-brand credit card partners based on the cost of partners' marketing activities and loyalty program rewards provided to credit cardholders, new account originations and sales volumes. Payments to partners based on marketing efforts undertaken by the partners are expensed by the Bank as incurred and reported as marketing expense. Payments for partner loyalty program rewards are reported as a reduction of card income when incurred. Payments to partners based on new credit card account originations are accounted for as direct loan origination costs and are deferred and recognized as a reduction of card income on a straight-line basis over a 12-month period. Payments to partners based on sales volumes are reported as a reduction of card income when the related interchange income is earned.

The following table presents the components of card income:

Year ended December 31, (in millions)	2019	2018	2017
Interchange and merchant processing income	\$ 20,370	\$ 18,808	\$ 17,080
Reward costs and partner payments	(14,312)	(13,074) <sup>(b)</sup>	(10,820)
Other card income <sup>(a)</sup>	(754)	(745)	(1,827)
<b>Total card income</b>	<b>\$ 5,304</b>	<b>\$ 4,989</b>	<b>\$ 4,433</b>

(a) Predominantly represents account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

(b) Includes an adjustment to the credit card rewards liability of approximately \$330 million, recorded during the first half of 2018.

Refer to Note 19 for information on operating lease income included within other income.

### Noninterest expense

#### Other expense

Other expense on the Bank's Consolidated statements of income included the following:

Year ended December 31, (in millions)	2019	2018	2017
Legal expense/(benefit)	\$ 206	\$ 75	\$ (135)
Federal Deposit Insurance Corporation ("FDIC")-related expense	457	1,239	1,492

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### Note 8 – Interest income and Interest expense

Interest income and interest expense are recorded in the Consolidated statements of income and classified based on the nature of the underlying asset or liability.

The following table presents the components of interest income and interest expense:

Year ended December 31, (in millions)	2019	2018	2017
<b>Interest income</b>			
Loans <sup>(a)</sup>	\$50,320	\$47,558	\$40,948
Taxable securities	7,959	5,645	5,520
Non-taxable securities <sup>(b)</sup>	1,273	1,498	1,718
Total investment securities <sup>(a)</sup>	9,232	7,143	7,238
Trading assets	6,320	5,091	4,700
Federal funds sold and securities purchased under resale agreements	4,742	2,241	1,249
Securities borrowed	304	195	67
Deposits with banks	3,884	5,909	4,237
All other interest-earning assets <sup>(c)</sup>	864	644	381
<b>Total interest income<sup>(c)</sup></b>	<b>75,666</b>	<b>68,781</b>	<b>58,820</b>
<b>Interest expense</b>			
Interest-bearing deposits	10,761	7,311	3,822
Federal funds purchased and securities loaned or sold under repurchase agreements	1,996	1,210	518
Trading liabilities - debt, short-term and all other interest-bearing liabilities <sup>(c)</sup>	1,521	1,475	1,309
Long-term debt	2,187	2,178	1,697
Beneficial interest issued by consolidated VIEs	543	450	500
<b>Total interest expense<sup>(c)</sup></b>	<b>17,008</b>	<b>12,624</b>	<b>7,846</b>
<b>Net interest income</b>	<b>58,658</b>	<b>56,157</b>	<b>50,974</b>
Provision for credit losses	5,593	4,872	5,298
<b>Net interest income after provision for credit losses</b>	<b>\$53,065</b>	<b>\$51,285</b>	<b>\$45,676</b>

- (a) Includes the amortization/accretion of unearned income (e.g., purchase premiums/discounts, net deferred fees/costs, etc.).
- (b) Represents securities that are tax-exempt for U.S. federal income tax purposes.
- (c) During the first half of 2019, the Bank implemented certain presentation changes that impacted interest income and interest expense, but had no effect on net interest income. These changes were made to align the accounting treatment between the balance sheet and the related interest income or expense, primarily by offsetting interest income and expense for certain prime brokerage-related held-for-investment customer receivables and payables that are currently presented as a single margin account on the balance sheet. These changes were applied retrospectively and, accordingly, prior period amounts were revised to conform with the current presentation.

Interest income and interest expense includes the current-period interest accruals for financial instruments measured at fair value, except for derivatives and financial instruments containing embedded derivatives that would be separately accounted for in accordance with U.S. GAAP, absent the fair value option election; for those instruments, all changes in fair value including any interest elements, are reported in principal transactions revenue. For financial

instruments that are not measured at fair value, the related interest is included within interest income or interest expense, as applicable. Refer to Notes 13, 11, 12 and 20, for further information on accounting for interest income and interest expense related to loans, investment securities, securities financing activities (i.e., securities purchased or sold under resale or repurchase agreements; securities borrowed; and securities loaned) and long-term debt, respectively.

### Note 9 – Pension and other postretirement employee benefit plans

The Bank has various defined benefit pension plans and other postretirement employee benefit (“OPEB”) plans that provide benefits to its employees in the U.S. and certain non-U.S. locations. On March 21, 2018 JPMorgan Chase & Co. transferred its qualified U.S. defined benefit pension plan to the Bank. The transfer was accomplished via a noncash capital contribution and was comprised of a net pension asset of \$3.2 billion, accumulated other comprehensive income of \$1.6 billion (net of taxes), and a deferred tax liability of \$760 million. JPMorgan Chase & Co. transferred cash equal to the value of the deferred tax liability to the Bank. U.S. employees are provided pension benefits through this qualified noncontributory U.S. defined benefit pension plan. Prior to the transfer, the Bank’s U.S. defined benefit pension expense was determined based upon employee participation in the JPMorgan Chase plan and effected through an intercompany charge from JPMorgan Chase, which was cash settled monthly. The Bank was charged \$204 million in 2017, for U.S. qualified defined benefit pension plan expense.

The principal defined benefit pension plan in the U.S. is a qualified noncontributory plan that provides benefits to substantially all U.S. employees of JPMorgan Chase. In connection with changes to the U.S. Retirement Savings Program during the fourth quarter of 2018, the Bank announced that it will freeze the U.S. defined benefit pension plan (the “Plan Freeze”). Commencing on January 1, 2020 (and January 1, 2019 for new hires), new pay credits are directed to the U.S. defined contribution plan. Interest credits on the U.S. defined benefit pension plan will continue to accrue. As a result, a curtailment was triggered and a remeasurement of the U.S. defined benefit pension obligation and plan assets occurred as of November 30, 2018. The plan design change did not have a material impact on the U.S. defined benefit pension plan or the Bank’s Consolidated Financial Statements.

The Bank also has defined benefit pension plans that are offered in certain non-U.S. locations based on factors such as eligible compensation, age and/or years of service. It is the Bank’s policy to fund the pension plans in amounts sufficient to meet the requirements under applicable laws. The Bank does not anticipate at this time making any contribution to the U.S. defined benefit pension plan in 2020. The 2020 contributions to the non-U.S. defined

benefit pension plans are expected to be \$49 million of which \$34 million are contractually required.

The Bank offers postretirement medical and life insurance benefits to certain U.S. retirees and postretirement medical benefits to certain qualifying U.S. employees through JPMorgan Chase plans. The Bank's U.S. postretirement medical benefit expense is determined based upon employee participation in the JPMorgan Chase plans and effected through an intercompany charge from JPMorgan Chase, which is cash settled monthly. The Bank was charged \$1 million for each of the years 2019, 2018 and 2017, for U.S. OPEB plan expense.

The Bank also offers certain qualifying employees in the U.S. the ability to participate in a number of nonqualified noncontributory defined benefit pension plans that are unfunded. These plans provide supplemental defined pension benefits to certain employees.

The Bank also provides a qualified defined contribution plan in the U.S. and maintains other similar arrangements in certain non-U.S. locations.

Pension and OPEB accounting guidance generally requires that the difference between plan assets at fair value and the benefit obligation be measured and recorded on the balance sheet. Plans that are overfunded (excess of plan assets over benefit obligation) are recorded in other assets and plans that are underfunded (excess benefit obligation over plan assets) are recorded in other liabilities. Gains or losses resulting from changes in the benefit obligation and the value of plan assets are recorded in OCI and recognized as part of the net periodic benefit cost over subsequent periods as discussed in the Gains and losses section of this Note. Additionally, benefits earned during the year are reported in compensation expense; all other components of net periodic defined benefit costs are reported in other expense in the Consolidated statements of income.

The following table presents the changes in benefit obligations, plan assets, the net funded status, and the pretax pension amounts recorded in AOCI on the Consolidated balance sheets for the Bank's significant defined benefit pension plans, and the weighted-average actuarial annualized assumptions for the projected and accumulated postretirement benefit obligations.

As of or for the year ended December 31, (in millions)	Defined benefit pension plans	
	2019	2018
<b>Change in benefit obligation</b>		
Benefit obligation, beginning of year	\$ (15,382)	\$ (3,857)
Transfer from JPMorgan Chase	–	(12,486)
Benefits earned during the year	(353)	(352)
Interest cost on benefit obligations	(593)	(551)
Plan amendments	(5)	(29)
Plan curtailment	–	122
Employee contributions	(8)	(7)
Net gain/(loss) <sup>(a)</sup>	(1,291)	924
Benefits paid	815	861
Plan settlements	–	15
Foreign exchange impact and other	(196)	(22)
<b>Benefit obligation, end of year<sup>(b)</sup></b>	<b>\$ (17,013)</b>	<b>\$ (15,382)</b>
<b>Change in plan assets</b>		
Fair value of plan assets, beginning of year	\$ 18,052	\$ 3,921
Transfer from JPMorgan Chase	–	15,702
Actual return on plan assets	2,932	(568)
The Bank contributions	75	63
Employee contributions	8	7
Benefits paid	(815)	(861)
Plan settlements	–	(15)
Foreign exchange impact and other	121	(197)
<b>Fair value of plan assets, end of year<sup>(b)(c)</sup></b>	<b>\$ 20,373</b>	<b>\$ 18,052</b>
Net funded/(unfunded) status <sup>(d)(e)</sup>	\$ 3,360	\$ 2,670
<b>Accumulated benefit obligation, end of year</b>		
	\$ (16,992)	\$ (15,382)
<b>Pretax pension amounts recorded in AOCI</b>		
Net gain/(loss)	\$ (2,237)	\$ (3,102)
Prior service credit/(cost)	(26)	(23)
<b>Accumulated other comprehensive income/(loss), pretax, end of year</b>		
	\$ (2,263)	\$ (3,125)
<b>Weighted-average actuarial assumptions used to determine benefit obligations</b>		
Discount rate <sup>(f)</sup>	0.20 - 3.30%	0.60 - 4.30%
Rate of compensation increase <sup>(f)</sup>	2.25 - 3.00	2.25 - 3.00
Interest crediting rate <sup>(f)</sup>	1.78 - 4.65%	1.81 - 4.90

- (a) At December 31, 2019 and 2018, the gain/(loss) was primarily attributed to the change in the discount rate.
- (b) At December 31, 2019 and 2018, included non-U.S. benefit obligations of \$(3.8) billion and \$(3.3) billion, and plan assets of \$4.0 billion and \$3.5 billion, respectively, predominantly in the UK.
- (c) At December 31, 2019 and 2018, defined benefit pension plan amounts that were not measured at fair value included \$1.3 billion and \$340 million, respectively, of accrued receivables, and \$1.7 billion and \$503 million, respectively, of accrued liabilities.
- (d) Represents plans with an aggregate overfunded balance of \$3.9 billion and \$3.1 billion at December 31, 2019 and 2018, respectively, and plans with an aggregate underfunded balance of \$519 million and \$390 million at December 31, 2019 and 2018, respectively.
- (e) For pension plans with a projected benefit obligation exceeding plan assets, the projected benefit obligation and fair value of plan assets was \$1.4 billion and \$885 million at December 31, 2019, respectively and \$1.2 billion and \$762 million at December 31, 2018, respectively. For pension plans with an accumulated benefit obligation exceeding plan assets, the accumulated benefit obligation and fair value of plan assets was \$1.4 billion and \$885 million at December 31, 2019,

respectively, and \$1.1 billion and \$762 million at December 31, 2018, respectively.

- (f) For the U.S. defined benefit pension plans, the discount rate assumption is 3.30% and 4.30% for 2019 and 2018, respectively, and the interest crediting rate is 4.65% and 4.90% for 2019 and 2018, respectively. The rate of compensation increase was not applicable to the U.S. plan in 2019 due to the Plan Freeze, and was 2.30% in 2018. The rate of compensation increase presented in the table for 2019 applies to the non-U.S. plans.

### Gains and losses

For the Bank's defined benefit pension plans, fair value is used to determine the expected return on plan assets. Amortization of net gains and losses is included in annual net periodic benefit cost if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the projected benefit obligation or the fair value of the plan assets. Any excess is amortized over the average future service period of defined benefit pension plan participants, which for the U.S. defined benefit pension plan is currently eight years and for the non-U.S. defined benefit pension plans is the period appropriate for the affected plan. As a result of the Plan Freeze, beginning in 2020, any excess for the U.S. defined benefit pension plan will be amortized over the average expected lifetime of plan participants which is currently 38 years. In addition, prior service costs are amortized over the average remaining service period of active employees expected to receive benefits under the plan when the prior service cost is first recognized.

The following table presents the components of net periodic benefit costs reported in the Consolidated statements of income for the Bank's significant defined benefit pension and defined contribution plans, and in other comprehensive income for the significant defined benefit pension plans, and the weighted-average annualized actuarial assumptions for the net periodic benefit cost.

Year ended December 31, (in millions)	Pension plans		
	2019	2018	2017
<b>Components of net periodic benefit cost</b>			
Benefits earned during the year	\$ 353	\$ 352	\$ 29
Interest cost on benefit obligations	593	551	83
Expected return on plan assets	(915)	(980)	(136)
Amortization:			
Net (gain)/loss	166	99	34
Prior service (credit)/cost	3	(23)	(2)
Curtailed (gain)/loss	—	21	—
Settlement (gain)/loss	—	2	2
<b>Net periodic defined benefit cost<sup>(a)</sup></b>	<b>200</b> <sup>(c)</sup>	<b>22</b> <sup>(c)</sup>	<b>10</b>
Other defined benefit pension plans <sup>(b)</sup>	19	8	15
<b>Total defined benefit plans</b>	<b>219</b>	<b>30</b>	<b>25</b>
Total defined contribution plans	844	741	680
<b>Total pension cost included in noninterest expense</b>	<b>\$ 1,063</b>	<b>\$ 771</b>	<b>\$ 705</b>
<b>Changes in plan assets and benefit obligations recognized in other comprehensive income<sup>(d)</sup></b>			
Transfer from JPMorgan Chase	\$ —	\$ 2,123	\$ —
Prior service (credit)/cost arising during the year	5	29	—
Net (gain)/loss arising during the year	(725)	503	(33)
Amortization of net loss	(166)	(99)	(34)
Amortization of prior service (cost)/credit	(3)	23	2
Curtailed gain/(loss)	—	(21)	—
Settlement gain/(loss)	—	(2)	(2)
Foreign exchange impact and other	27	25	52
<b>Total recognized in other comprehensive income</b>	<b>\$ (862)</b>	<b>\$ 2,581</b>	<b>\$ (15)</b>
<b>Total recognized in net periodic benefit cost and other comprehensive income</b>	<b>\$ (662)</b>	<b>\$ 2,603</b>	<b>\$ (5)</b>
<b>Weighted-average assumptions used to determine net periodic benefit costs</b>			
Discount rate <sup>(e)</sup>	<b>0.60 - 4.30%</b>	0.60 - 4.50%	0.60 - 4.30%
Expected long-term rate of return on plan assets <sup>(e)</sup>	<b>0.00 - 5.50</b>	0.70 - 5.50	0.70 - 4.30
Rate of compensation increase <sup>(e)</sup>	<b>2.25 - 3.00</b>	2.25 - 3.00	2.25 - 3.00
Interest crediting rate <sup>(e)</sup>	<b>1.81 - 4.90%</b>	1.81 - 4.90	1.81 - 4.90

(a) Benefits earned during the year are reported in compensation expense; all other components of net periodic defined benefit costs are reported within other expense in the Consolidated statements of income.

(b) Includes various defined benefit pension plans which are individually immaterial.

(c) Includes \$9 million and \$(43) million, for the years ended December 31, 2019 and 2018, respectively, that was charged by the Bank to JPMorgan Chase and its non-bank subsidiaries for their share of the U.S. qualified defined benefit pension plan expense.

(d) Does not include amounts related to immaterial U.K. OPEB plan.

(e) The rate assumptions for the U.S. defined benefit pension plans are at the upper end of the range, except for the rate of compensation increase, which was 2.30% for 2019 and 2018, respectively.

## Plan assumptions

The Bank's expected long-term rate of return for defined benefit pension plan assets is a blended weighted average, by asset allocation of the projected long-term returns for the various asset classes, taking into consideration local market conditions and the specific allocation of plan assets. Returns on asset classes are developed using a forward-looking approach and are not strictly based on historical returns. Consideration is also given to current market conditions and the short-term portfolio mix of each plan.

The discount rate used in determining the benefit obligation under the U.S. defined benefit pension plan was provided by the Bank's actuaries. This rate was selected by reference to the yields on portfolios of bonds with maturity dates and coupons that closely match each of the plan's projected cash flows. The discount rate for the U.K. defined benefit pension plan represents a rate of appropriate duration from the analysis of yield curves provided by the Bank's actuaries.

At December 31, 2019, the Bank decreased the discount rates used to determine its benefit obligations for the U.S. defined benefit pension in light of current market interest rates, which is expected to decrease expense by approximately \$66 million in 2020. The 2020 expected long-term rate of return on U.S. defined benefit pension plan assets is 4.00%.

The following table represents the effect of a 25-basis point decline in the two listed rates below on estimated 2020 defined benefit pension plan expense, as well as the effect on the postretirement benefit obligations.

(in millions)	Defined benefit pension plan expense	Benefit obligation
Expected long-term rate of return	\$ 50	N/A
Discount rate	\$ 6	\$ 543

## Investment strategy and asset allocation

The assets of the Bank's defined benefit pension plans are held in various trusts and are invested in well-diversified portfolios of equity and fixed income securities, cash and cash equivalents, and alternative investments.

The investment policies for the assets of the Bank's defined benefit pension plans are to optimize the risk-return relationship as appropriate to the needs and goals of each plan using a global portfolio of various asset classes diversified by market segment, economic sector, and issuer. Assets are managed by a combination of internal and external investment managers. The Bank regularly reviews the asset allocations and asset managers, as well as other factors that impact the portfolios, which are rebalanced when deemed necessary.

Investments held by the plans include financial instruments which are exposed to various risks such as interest rate, market and credit risks. Exposure to a concentration of credit risk is mitigated by the broad diversification of both U.S. and non-U.S. investments. Additionally, the investments in each of the collective investment funds and/or registered investment companies are further diversified into various financial instruments. As of December 31, 2019, assets held by the Bank's defined benefit pension plans do not include securities issued by JPMorgan Chase or its affiliates, except through indirect exposures through investments in ETFs, mutual funds and collective investment funds managed by third-parties. The plans hold investments that are sponsored or managed by affiliates of JPMorgan Chase in the amount of \$3.1 billion and \$3.7 billion, as of December 31, 2019 and 2018, respectively.

The following table presents the weighted-average asset allocation of the fair values of total plan assets at December 31 for the years indicated, as well as the respective approved asset allocation ranges by asset class.

December 31,	Asset Allocation	% of plan assets <sup>(c)</sup>	
		2019	2018
<b>Asset class</b>			
Debt securities <sup>(a)</sup>	42-100%	<b>74%</b>	48%
Equity securities	0-40	<b>16</b>	37
Real Estate	0-6	<b>1</b>	2
Alternatives <sup>(b)</sup>	0-24	<b>9</b>	13
<b>Total</b>	100%	<b>100%</b>	100%

(a) Debt securities primarily includes cash and cash equivalents, corporate debt, U.S. federal, state, local and non-U.S. government, asset-backed and mortgage-backed securities.

(b) Alternatives primarily include limited partnerships.

(c) Represents the U.S. defined benefit pension plan only, as that is the most significant plan.

## Fair value measurement of the plans' assets and liabilities

Refer to Note 3 for information on fair value measurements, including descriptions of level 1, 2, and 3 of the fair value hierarchy and the valuation methods employed by the Bank.

### Pension plan assets and liabilities measured at fair value

December 31, (in millions)	Defined benefit pension plans							
	2019				2018			
	Level 1	Level 2	Level 3	Total fair value	Level 1	Level 2	Level 3	Total fair value
Cash and cash equivalents	\$ 157	\$ 1	\$ —	\$ 158	\$ 343	\$ 1	\$ —	\$ 344
Equity securities	3,240	184	2	3,426	5,342	162	2	5,506
Collective investment funds <sup>(a)</sup>	265	—	—	265	161	—	—	161
Limited partnerships <sup>(b)</sup>	187	—	—	187	40	—	—	40
Corporate debt securities <sup>(c)</sup>	—	7,090	2	7,092	—	3,540	3	3,543
U.S. federal, state, local and non-U.S. government debt securities	1,790	1,054	—	2,844	1,191	743	—	1,934
Mortgage-backed securities	314	701	4	1,019	82	272	3	357
Derivative receivables	—	337	—	337	—	143	—	143
Other <sup>(d)</sup>	785	132	250	1,167	885	80	302	1,267
<b>Total assets measured at fair value<sup>(e)</sup></b>	<b>\$ 6,738</b>	<b>\$ 9,499</b>	<b>\$ 258</b>	<b>\$ 16,495</b>	<b>\$ 8,044</b>	<b>\$ 4,941</b>	<b>\$ 310</b>	<b>\$ 13,295</b>
Derivative payables	\$ —	\$ (118)	\$ —	\$ (118)	\$ —	\$ (96)	\$ —	\$ (96)
<b>Total liabilities measured at fair value<sup>(e)</sup></b>	<b>\$ —</b>	<b>\$ (118)</b>	<b>\$ —</b>	<b>\$ (118)</b>	<b>\$ —</b>	<b>\$ (96)</b>	<b>\$ —</b>	<b>\$ (96)</b>

- (a) At December 31, 2019 and 2018, collective investment funds primarily included a mix of short-term investment funds, U.S. and non-U.S. equity investments (including index) and real estate funds.
- (b) Unfunded commitments to purchase limited partnership investments for the plans were \$451 million and \$521 million for 2019 and 2018, respectively.
- (c) Corporate debt securities include debt securities of U.S. and non-U.S. corporations.
- (d) Other consists primarily of mutual funds, money market funds and participating annuity contracts. Mutual funds and money market funds are primarily classified within level 1 of the fair value hierarchy given they are valued using market observable prices. Participating annuity contracts are classified within level 3 of the fair value hierarchy due to a lack of market mechanisms for transferring each policy and surrender restrictions.
- (e) At December 31, 2019 and 2018, excludes \$4.4 billion and \$5.0 billion of certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient, which are not required to be classified in the fair value hierarchy, \$1.3 billion and \$340 million of defined benefit pension plan receivables for investments sold and dividends and interest receivables, \$1.7 billion and \$479 million of defined benefit pension plan payables for investments purchased, and \$25 million and \$24 million of other liabilities, respectively.

### Changes in level 3 fair value measurements using significant unobservable inputs

(in millions)	Fair value, Beginning balance	Actual return on plan assets		Purchases, sales and settlements, net	Transfers in and/or out of level 3	Fair value, Ending balance
		Realized gains/(losses)	Unrealized gains/(losses)			
<b>Year ended December 31, 2019</b>						
<b>U.S. defined benefit pension plan</b>						
<b>Annuity contracts and other <sup>(a)</sup></b>	<b>\$ 310</b>	<b>\$ —</b>	<b>\$ 31</b>	<b>\$ (85)</b>	<b>\$ 2</b>	<b>\$ 258</b>
<b>Year ended December 31, 2018</b>						
<b>U.S. defined benefit pension plan</b>						
<b>Annuity contracts and other <sup>(a)</sup></b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ —</b>	<b>\$ (1)</b>	<b>\$ 311 <sup>(b)</sup></b>	<b>\$ 310</b>

(a) Substantially all are participating annuity contracts.

(b) Represents level 3 assets transferred in by JPMorgan Chase.

### Estimated future benefit payments

The following table presents benefit payments expected to be paid, which include the effect of expected future service, for the years indicated.

Year ended December 31, (in millions)	Defined benefit pension plans
2020	\$ 1,025
2021	1,015
2022	1,015
2023	976
2024	966
Years 2025-2029	4,596

## Notes to consolidated financial statements

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### Note 10 – Employee share-based incentives

#### Employee share-based awards

The Bank's employees receive annual incentive compensation based on their performance, the performance of their business and JPMorgan Chase's consolidated operating results. The Bank's employees participate, to the extent they meet minimum eligibility requirements, in various share-based incentive plans sponsored by JPMorgan Chase.

In 2019, 2018 and 2017, JPMorgan Chase granted long-term share-based awards to certain employees under its Long-Term Incentive Plan ("LTIP"), as amended and restated effective May 15, 2018. Under the terms of the LTIP, as of December 31, 2019, 75 million shares of JPMorgan Chase's common stock were available for issuance through May 2022. The LTIP is the only active plan under which JPMorgan Chase is currently granting share-based incentive awards. In the following discussion, the LTIP, plus prior JPMorgan Chase plans and plans assumed as the result of acquisitions, are referred to collectively as the "LTI Plans," and such plans constitute JPMorgan Chase's share-based incentive plans.

Restricted stock units ("RSUs") are awarded at no cost to the recipient upon their grant. Generally, RSUs are granted annually and vest at a rate of 50% after two years and 50% after three years and are converted into shares of common stock as of the vesting date. In addition, RSUs typically include full-career eligibility provisions, which allow employees to continue to vest upon voluntary termination based on age or service-related requirements, subject to post-employment and other restrictions. All RSU awards are subject to forfeiture until vested and contain clawback provisions that may result in cancellation under certain specified circumstances. Predominantly all RSUs entitle the recipient to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSUs are outstanding.

Performance share units ("PSUs") are granted annually, and approved by JPMorgan Chase's Board of Directors, to members of JPMorgan Chase's Operating Committee under the variable compensation program. PSUs are subject to JPMorgan Chase's achievement of specified performance criteria over a three-year period. The number of awards that vest can range from zero to 150% of the grant amount. In addition, dividends that accrue during the vesting period are reinvested in dividend equivalent share units. PSUs and the related dividend equivalent share units are converted into shares of common stock after vesting.

Once the PSUs and dividend equivalent share units have vested, the shares of common stock that are delivered, after applicable tax withholding, must be held for an additional two-year period, for a total combined vesting and holding period of approximately five to eight years from the grant date depending on regulations in certain countries.

Under the LTI Plans, stock appreciation rights ("SARs") and stock options have generally been granted with an exercise price equal to the fair value of JPMorgan Chase's common stock on the grant date. SARs and stock options generally expire ten years after the grant date. There were no material grants of employee SARs or stock options in 2019, 2018 and 2017.

The Bank 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 Bank accrues the estimated value of awards expected to be awarded to employees as of the grant date without giving consideration to the impact of post-employment restrictions. For each tranche granted to employees who will become full-career eligible during the vesting period, compensation expense is recognized on a straight-line basis from the grant date until the earlier of the employee's full-career eligibility date or the vesting date of the respective tranche.

## RSUs, PSUs, employee SARs and stock options activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for employee SARs and stock options, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes the Bank's RSUs, PSUs, employee SARs and stock options activity for 2019.

Year ended December 31, 2019 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs		SARs/Options			
	Number of units	Weighted-average grant date fair value	Number of awards	Weighted-average exercise price	Weighted-average remaining contractual life (in years)	Aggregate intrinsic value
Outstanding, January 1	42,491	\$ 85.01	10,574	\$ 41.49		
Granted	17,571	99.43	17	111.23		
Exercised or vested	(20,979)	70.35	(6,079)	41.63		
Forfeited	(1,255)	97.78	—	—		
Canceled	NA	NA	(30)	89.71		
Transferred	437	85.01	89	41.49		
<b>Outstanding, December 31</b>	<b>38,265</b>	<b>\$ 99.23</b>	<b>4,571</b>	<b>\$ 41.30</b>	<b>1.9</b>	<b>\$ 446,074</b>
Exercisable, December 31	NA	NA	4,566	41.22	1.9	445,974

The total fair value of RSUs that vested during the years ended December 31, 2019, 2018 and 2017, was \$2.1 billion, \$2.5 billion and \$2.0 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2019, 2018 and 2017, was \$441 million, \$282 million and \$554 million, respectively.

### Compensation expense

The Bank recognized the following compensation expense related to its various employee share-based incentive plans in its Consolidated statements of income.

Year ended December 31, (in millions)	2019	2018	2017
Cost of prior grants of RSUs, PSUs, SARs and employee stock options that are amortized over their applicable vesting periods	\$ 842	\$ 904	\$ 802
Accrual of estimated costs of share-based awards to be granted in future periods including those to full-career eligible employees	804	778	688
<b>Total compensation expense related to employee share-based incentive plans</b>	<b>\$ 1,646</b>	<b>\$ 1,682</b>	<b>\$ 1,490</b>

There are no separate plans solely for the employees of the Bank and, therefore, the share-based compensation expense for the Bank is determined based upon employee participation in the JPMorgan Chase plans and effected through a charge from JPMorgan Chase, which is cash settled.

At December 31, 2019, approximately \$525 million (pretax) of compensation expense related to unvested awards had not yet been charged to net income. That cost is expected to be amortized into compensation expense over a weighted-average period of 1.6 years. The Bank does not capitalize any compensation expense related to share-based compensation awards to employees.

### Tax benefits

The Bank is recognizing its share of excess tax benefits (including tax benefits from dividends or dividend equivalents) on share-based payment awards within income tax expense in the Consolidated statements of income. Income tax benefits related to share-based incentive arrangements recognized in the Bank's Consolidated statements of income for the years ended December 31, 2019, 2018 and 2017, were \$667 million, \$753 million and \$739 million, respectively.

## Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
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### Note 11 – Investment securities

Investment securities consist of debt securities that are classified as AFS or HTM. Debt securities classified as trading assets are discussed in Note 3. Predominantly all of the Bank's AFS and HTM securities are held in connection with its asset-liability management activities. At December 31, 2019, the investment securities portfolio consisted of debt securities with an average credit rating of AA+ (based upon external ratings where available, and where not available, based primarily upon internal ratings). The Bank's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's, however the quantitative characteristics (e.g., PDs and LGDs) may differ as they reflect internal historical experiences and assumptions.

AFS securities are carried at fair value on the Consolidated balance sheets. Unrealized gains and losses, after any applicable hedge accounting adjustments, are reported as net increases or decreases to AOCI. The specific identification method is used to determine realized gains and losses on AFS securities, which are included in securities gains/(losses) on the Consolidated statements of income. HTM debt securities, which the Bank has the intent and ability to hold until maturity, are carried at amortized cost on the Consolidated balance sheets.

For both AFS and HTM debt securities, purchase discounts or premiums are generally amortized into interest income on a level-yield basis over the contractual life of the security. However, premiums on certain callable debt securities are amortized to the earliest call date.

During the second half of 2019, the Bank transferred \$6.2 billion of collateralized loan obligations from AFS to HTM for capital management purposes. These securities were transferred at fair value in a non-cash transaction.

The amortized costs and estimated fair values of the investment securities portfolio were as follows for the dates indicated.

December 31, (in millions)	2019				2018			
	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
<b>Available-for-sale securities</b>								
Mortgage-backed securities:								
U.S. GSEs and government agencies <sup>(a)</sup>	\$ 107,811	\$ 2,395	\$ 89	\$ 110,117	\$ 69,026	\$ 594	\$ 974	\$ 68,646
Residential:								
U.S.	10,223	233	6	10,450	5,877	79	31	5,925
Non-U.S.	2,477	64	1	2,540	2,529	72	6	2,595
Commercial	5,130	64	13	5,181	6,689	43	147	6,585
<b>Total mortgage-backed securities</b>	<b>125,641</b>	<b>2,756</b>	<b>109</b>	<b>128,288</b>	<b>84,121</b>	<b>788</b>	<b>1,158</b>	<b>83,751</b>
U.S. Treasury and government agencies	139,162	449	175	139,436	55,771	366	78	56,059
Obligations of U.S. states and municipalities	26,744	2,076	1	28,819	34,709	1,523	80	36,152
Certificates of deposit	77	—	—	77	75	—	—	75
Non-U.S. government debt securities	21,427	377	17	21,787	23,771	351	20	24,102
Corporate debt securities	823	22	—	845	1,904	23	9	1,918
Asset-backed securities:								
Collateralized loan obligations	25,038	9	56	24,991	19,612	1	176	19,437
Other	5,405	35	20	5,420	7,189	51	22	7,218
<b>Total available-for-sale securities</b>	<b>344,317</b>	<b>5,724</b>	<b>378</b>	<b>349,663</b>	<b>227,152</b>	<b>3,103</b>	<b>1,543</b>	<b>228,712</b>
<b>Held-to-maturity securities</b>								
Mortgage-backed securities:								
U.S. GSEs and government agencies <sup>(a)</sup>	36,523	1,165	62	37,626	26,610	134	200	26,544
<b>Total mortgage-backed securities</b>	<b>36,523</b>	<b>1,165</b>	<b>62</b>	<b>37,626</b>	<b>26,610</b>	<b>134</b>	<b>200</b>	<b>26,544</b>
U.S. Treasury and government agencies	51	—	1	50	—	—	—	—
Obligations of U.S. states and municipalities	4,797	299	—	5,096	4,824	105	15	4,914
Asset-backed securities:								
Collateralized loan obligations	6,169	—	—	6,169	—	—	—	—
<b>Total held-to-maturity securities</b>	<b>47,540</b>	<b>1,464</b>	<b>63</b>	<b>48,941</b>	<b>31,434</b>	<b>239</b>	<b>215</b>	<b>31,458</b>
<b>Total investment securities</b>	<b>\$ 391,857</b>	<b>\$ 7,188</b>	<b>\$ 441</b>	<b>\$ 398,604</b>	<b>\$ 258,586</b>	<b>\$ 3,342</b>	<b>\$ 1,758</b>	<b>\$ 260,170</b>

(a) Includes AFS U.S. GSE obligations with fair values of \$78.5 billion and \$50.7 billion, and HTM U.S. GSE obligations with amortized cost of \$31.6 billion and \$20.9 billion, at December 31, 2019 and 2018, respectively. As of December 31, 2019, mortgage-backed securities issued by Fannie Mae and Freddie Mac each exceeded 10% of JPMorgan Chase Bank, N.A.'s total stockholder's equity; the amortized cost and fair value of such securities were \$69.4 billion and \$71.4 billion, and \$38.7 billion and \$39.6 billion, respectively.

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### Investment securities impairment

The following tables present the fair value and gross unrealized losses for investment securities by aging category at December 31, 2019 and 2018.

December 31, 2019 (in millions)	Investment securities with gross unrealized losses					
	Less than 12 months		12 months or more		Total fair value	Total gross unrealized losses
	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses		
<b>Available-for-sale securities</b>						
Mortgage-backed securities:						
U.S. GSEs and government agencies	\$ 16,966	\$ 53	\$ 3,058	\$ 36	20,024	\$ 89
Residential:						
U.S.	1,072	3	423	3	1,495	6
Non-U.S.	13	—	420	1	433	1
Commercial	1,287	12	199	1	1,486	13
<b>Total mortgage-backed securities</b>	<b>19,338</b>	<b>68</b>	<b>4,100</b>	<b>41</b>	<b>23,438</b>	<b>109</b>
U.S. Treasury and government agencies	23,003	145	5,695	30	28,698	175
Obligations of U.S. states and municipalities	186	1	—	—	186	1
Certificates of deposit	77	—	—	—	77	—
Non-U.S. government debt securities	3,970	13	1,406	4	5,376	17
Corporate debt securities	—	—	—	—	—	—
Asset-backed securities:						
Collateralized loan obligations	10,364	11	7,756	45	18,120	56
Other	1,639	9	753	11	2,392	20
<b>Total available-for-sale securities</b>	<b>58,577</b>	<b>247</b>	<b>19,710</b>	<b>131</b>	<b>78,287</b>	<b>378</b>
<b>Held-to-maturity securities</b>						
Mortgage-backed securities:						
U.S. GSEs and government agencies	5,186	62	81	—	5,267	62
<b>Total mortgage-backed securities</b>	<b>5,186</b>	<b>62</b>	<b>81</b>	<b>—</b>	<b>5,267</b>	<b>62</b>
U.S. Treasury and government agencies	50	1	—	—	50	1
Obligations of U.S. states and municipalities	—	—	—	—	—	—
Asset-backed securities:						
Collateralized loan obligations	3,421	—	1,375	—	4,796	—
<b>Total held-to-maturity securities</b>	<b>8,657</b>	<b>63</b>	<b>1,456</b>	<b>—</b>	<b>10,113</b>	<b>63</b>
<b>Total investment securities with gross unrealized losses</b>	<b>\$ 67,234</b>	<b>\$ 310</b>	<b>\$ 21,166</b>	<b>\$ 131</b>	<b>\$ 88,400</b>	<b>\$ 441</b>

December 31, 2018 (in millions)	Investment securities with gross unrealized losses					
	Less than 12 months		12 months or more		Total fair value	Total gross unrealized losses
	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses		
<b>Available-for-sale securities</b>						
Mortgage-backed securities:						
U.S. GSEs and government agencies	\$ 17,656	\$ 318	\$ 22,728	\$ 656	\$ 40,384	\$ 974
Residential:						
U.S.	623	4	1,445	27	2,068	31
Non-U.S.	907	5	165	1	1,072	6
Commercial	960	6	3,172	141	4,132	147
<b>Total mortgage-backed securities</b>	<b>20,146</b>	<b>333</b>	<b>27,510</b>	<b>825</b>	<b>47,656</b>	<b>1,158</b>
U.S. Treasury and government agencies	4,792	7	2,391	71	7,183	78
Obligations of U.S. states and municipalities	1,808	15	2,477	65	4,285	80
Certificates of deposit	75	—	—	—	75	—
Non-U.S. government debt securities	3,123	5	1,937	15	5,060	20
Corporate debt securities	478	8	37	1	515	9
Asset-backed securities:						
Collateralized loan obligations	18,681	176	—	—	18,681	176
Other	1,208	6	2,354	16	3,562	22
<b>Total available-for-sale securities</b>	<b>50,311</b>	<b>550</b>	<b>36,706</b>	<b>993</b>	<b>87,017</b>	<b>1,543</b>
<b>Held-to-maturity securities</b>						
Mortgage-backed securities:						
U.S. GSEs and government agencies	4,385	23	7,082	177	11,467	200
<b>Total mortgage-backed securities</b>	<b>4,385</b>	<b>23</b>	<b>7,082</b>	<b>177</b>	<b>11,467</b>	<b>200</b>
Obligations of U.S. states and municipalities	12	—	1,114	15	1,126	15
<b>Total held-to-maturity securities</b>	<b>4,397</b>	<b>23</b>	<b>8,196</b>	<b>192</b>	<b>12,593</b>	<b>215</b>
<b>Total investment securities with gross unrealized losses</b>	<b>\$ 54,708</b>	<b>\$ 573</b>	<b>\$ 44,902</b>	<b>\$ 1,185</b>	<b>\$ 99,610</b>	<b>\$ 1,758</b>

### Other-than-temporary impairment

AFS and HTM debt securities in unrealized loss positions are analyzed as part of the Bank's ongoing assessment of OTTI. The Bank considers a decline in fair value to be other-than-temporary when the Bank does not expect to recover the entire amortized cost basis of the security.

For AFS debt securities, the Bank recognizes OTTI losses in earnings if the Bank has the intent to sell the debt security, or if it is more likely than not that the Bank will be required to sell the debt security before recovery of its amortized cost basis. In these circumstances the impairment loss is equal to the full difference between the amortized cost basis and the fair value of the securities.

For debt securities in an unrealized loss position that the Bank has the intent and ability to hold, the securities are evaluated to determine if a credit loss exists. In the event of a credit loss, only the amount of impairment associated with the credit loss is recognized in income. Amounts relating to factors other than credit losses are recorded in OCI.

Factors considered in evaluating potential OTTI include adverse conditions specifically related to the industry, geographic area or financial condition of the issuer or underlying collateral of a security; payment structure of the

security; changes to the rating of the security by a rating agency; the volatility of the fair value changes; and the Bank's intent and ability to hold the security until recovery.

The Bank's cash flow evaluations take into account the factors noted above and expectations of relevant market and economic data as of the end of the reporting period. When assessing securities issued in a securitization for OTTI, the Bank estimates cash flows considering underlying loan-level data and structural features of the securitization, such as subordination, excess spread, overcollateralization or other forms of credit enhancement, and compares the losses projected for the underlying collateral ("pool losses") against the level of credit enhancement in the securitization structure to determine whether these features are sufficient to absorb the pool losses, or whether a credit loss exists. The Bank also performs other analyses to support its cash flow projections, such as first-loss analyses or stress scenarios.

For beneficial interests in securitizations that are rated below "AA" at their acquisition, or that can be contractually prepaid or otherwise settled in such a way that the Bank would not recover substantially all of its recorded investment, the Bank considers an impairment to be other-than-temporary when there is an adverse change in expected cash flows.

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The Bank recognizes unrealized losses on investment securities that it intends to sell as OTTI. The Bank does not intend to sell any of the remaining investment securities with an unrealized loss in AOCI as of December 31, 2019, and it is not likely that the Bank will be required to sell these securities before recovery of their amortized cost basis. Further, the Bank did not recognize any credit-related OTTI losses during the year ended December 31, 2019. Based on its assessment, the Bank believes that the investment securities with an unrealized loss in AOCI as of December 31, 2019, are not other-than-temporarily impaired.

### Investment securities gains and losses

The following table presents realized gains and losses and OTTI from AFS securities that were recognized in income.

Year ended December 31, (in millions)	2019	2018	2017
Realized gains	\$ 645	\$ 211	\$ 1,007
Realized losses	(392)	(606)	(1,073)
OTTI losses <sup>(a)</sup>	—	—	(7)
<b>Net investment securities gains/ (losses)</b>	<b>\$ 253</b>	<b>\$ (395)</b>	<b>\$ (73)</b>

(a) Represents OTTI losses recognized in income on investment securities the Bank intends to sell. Excludes realized losses on securities sold of \$22 million and \$6 million for the years ended December 31, 2018 and 2017, respectively, that had been previously reported as an OTTI loss due to the intention to sell the securities.

### Changes in the credit loss component of credit-impaired debt securities

The cumulative credit loss component, including any changes therein, of OTTI losses that have been recognized in income related to AFS securities was not material as of and during the years ended December 31, 2019, 2018 and 2017.

## Contractual maturities and yields

The following table presents the amortized cost and estimated fair value at December 31, 2019, of the Bank's investment securities portfolio by contractual maturity.

By remaining maturity December 31, 2019 (in millions)	Due in one year or less	Due after one year through five years	Due after five years through 10 years	Due after 10 years <sup>(b)</sup>	Total
<b>Available-for-sale securities</b>					
Mortgage-backed securities					
Amortized cost	\$ 1	\$ 58	\$ 11,073	\$ 114,509	\$ 125,641
Fair value	1	58	11,251	116,978	128,288
Average yield <sup>(a)</sup>	1.99%	2.78%	2.76%	3.40%	3.34%
U.S. Treasury and government agencies					
Amortized cost	\$ 10,687	\$ 92,805	\$ 26,353	\$ 9,317	\$ 139,162
Fair value	10,700	93,038	26,447	9,251	139,436
Average yield <sup>(a)</sup>	1.82%	1.84%	1.90%	1.98%	1.86%
Obligations of U.S. states and municipalities					
Amortized cost	\$ 64	\$ 166	\$ 739	\$ 25,775	\$ 26,744
Fair value	64	174	791	27,790	28,819
Average yield <sup>(a)</sup>	2.26%	4.53%	5.16%	4.83%	4.84%
Certificates of deposit					
Amortized cost	\$ 77	\$ —	\$ —	\$ —	\$ 77
Fair value	77	—	—	—	77
Average yield <sup>(a)</sup>	0.50%	—%	—%	—%	0.50%
Non-U.S. government debt securities					
Amortized cost	\$ 6,672	\$ 11,544	\$ 2,898	\$ 313	\$ 21,427
Fair value	6,682	11,791	3,001	313	21,787
Average yield <sup>(a)</sup>	2.17%	1.84%	1.29%	1.67%	1.87%
Corporate debt securities					
Amortized cost	\$ 205	\$ 206	\$ 412	\$ —	\$ 823
Fair value	207	212	426	—	845
Average yield <sup>(a)</sup>	4.49%	4.14%	3.50%	—%	3.91%
Asset-backed securities					
Amortized cost	\$ 17	\$ 2,353	\$ 7,184	\$ 20,889	\$ 30,443
Fair value	17	2,353	7,177	20,864	30,411
Average yield <sup>(a)</sup>	0.62%	2.78%	2.86%	2.77%	2.79%
<b>Total available-for-sale securities</b>					
Amortized cost	\$ 17,723	\$ 107,132	\$ 48,659	\$ 170,803	\$ 344,317
Fair value	17,748	107,626	49,093	175,196	349,663
Average yield <sup>(a)</sup>	1.98%	1.87%	2.27%	3.46%	2.72%
<b>Held-to-maturity securities</b>					
Mortgage-backed securities					
Amortized Cost	\$ —	\$ —	\$ 5,850	\$ 30,673	\$ 36,523
Fair value	—	—	6,114	31,512	37,626
Average yield <sup>(a)</sup>	—%	—%	3.06%	3.10%	3.10%
U.S. Treasury and government agencies					
Amortized cost	\$ —	\$ 51	\$ —	\$ —	\$ 51
Fair value	—	50	—	—	50
Average yield <sup>(a)</sup>	—%	1.47%	—%	—%	1.47%
Obligations of U.S. states and municipalities					
Amortized cost	\$ —	\$ —	\$ 99	\$ 4,698	\$ 4,797
Fair value	—	—	106	4,990	5,096
Average yield <sup>(a)</sup>	—%	—%	3.91%	4.04%	4.04%
Asset-backed securities					
Amortized cost	\$ —	\$ —	\$ 5,296	\$ 873	\$ 6,169
Fair value	—	—	5,296	873	6,169
Average yield <sup>(a)</sup>	—%	—%	3.19%	3.11%	1.47%
<b>Total held-to-maturity securities</b>					
Amortized cost	\$ —	\$ 51	\$ 11,245	\$ 36,244	\$ 47,540
Fair value	—	50	11,516	37,375	48,941
Average yield <sup>(a)</sup>	—%	1.47%	1.63%	3.15%	2.79%

(a) Average yield is computed using the effective yield of each security owned at the end of the period, weighted based on the amortized cost of each security. The effective yield considers the contractual coupon, amortization of premiums and accretion of discounts, and the effect of related hedging derivatives. Taxable-equivalent amounts are used

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where applicable. The effective yield excludes unscheduled principal prepayments; and accordingly, actual maturities of securities may differ from their contractual or expected maturities as certain securities may be prepaid.

- (b) Substantially all of the Bank's U.S. residential MBS and collateralized mortgage obligations are due in 10 years or more, based on contractual maturity. The estimated weighted-average life, which reflects anticipated future prepayments, is approximately 6 years for agency residential MBS, 3 years for agency residential collateralized mortgage obligations and 2 years for nonagency residential collateralized mortgage obligations.

### Note 12 – Securities financing activities

The Bank enters into resale, repurchase, securities borrowed and securities loaned agreements (collectively, “securities financing agreements”) primarily to finance the Bank's inventory positions, acquire securities to cover short sales, accommodate customers' financing needs, settle other securities obligations and to deploy the Bank's excess cash.

Securities financing agreements are treated as collateralized financings on the Bank's Consolidated balance sheets. Resale and repurchase agreements are generally carried at the amounts at which the securities will be subsequently sold or repurchased. Securities borrowed and securities loaned agreements are generally carried at the amount of cash collateral advanced or received. Where appropriate under applicable accounting guidance, securities financing agreements with the same counterparty are reported on a net basis. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. Fees received and paid in connection with securities financing agreements are recorded over the life of the agreement in interest income and interest expense on the Consolidated statements of income.

The Bank has elected the fair value option for certain securities financing agreements. Refer to Note 4 for further information regarding the fair value option. The securities financing agreements for which the fair value option has been elected are reported within securities purchased under resale agreements, securities loaned or sold under repurchase agreements, and securities borrowed on the Consolidated balance sheets. Generally, for agreements carried at fair value, current-period interest accruals are recorded within interest income and interest expense, with changes in fair value reported in principal transactions revenue. However, for financial instruments containing embedded derivatives that would be separately accounted for in accordance with accounting guidance for hybrid instruments, all changes in fair value, including any interest elements, are reported in principal transactions revenue.

Securities financing agreements expose the Bank primarily to credit and liquidity risk. To manage these risks, the Bank monitors the value of the underlying securities (predominantly high-quality securities collateral, including government-issued debt and U.S. GSEs and government agencies MBS) that it has received from or provided to its counterparties compared to the value of cash proceeds and exchanged collateral, and either requests additional collateral or returns securities or collateral when appropriate. Margin levels are initially established based upon the counterparty, the type of underlying securities, and the permissible collateral, and are monitored on an ongoing basis.

In resale and securities borrowed agreements, the Bank is exposed to credit risk to the extent that the value of the securities received is less than initial cash principal advanced and any collateral amounts exchanged. In repurchase and securities loaned agreements, credit risk exposure arises to the extent that the value of underlying securities advanced exceeds the value of the initial cash principal received, and any collateral amounts exchanged.

Additionally, the Bank 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 Bank's policy to take possession, where possible, of the securities underlying resale and securities borrowed agreements. Refer to Note 27 for further information regarding assets pledged and collateral received in securities financing agreements.

As a result of the Bank's credit risk mitigation practices with respect to resale and securities borrowed agreements as described above, the Bank did not hold any reserves for credit impairment with respect to these agreements as of December 31, 2019 and 2018.

The table below summarizes the gross and net amounts of the Bank's securities financing agreements, as of December 31, 2019 and 2018. When the Bank has obtained an appropriate legal opinion with respect to a master netting agreement with a counterparty and where other relevant netting criteria under U.S. GAAP are met, the Bank nets, on the Consolidated balance sheets, the balances outstanding under its securities financing agreements with the same counterparty. In addition, the Bank exchanges securities and/or cash collateral with its counterparty to reduce the economic exposure with the counterparty, but such collateral is not eligible for net Consolidated balance sheet presentation. Where the Bank has obtained an appropriate legal opinion with respect to the counterparty master netting agreement, such collateral, along with securities financing balances that do not meet all these relevant netting criteria under U.S. GAAP, is presented in the table below as "Amounts not nettable on the Consolidated balance sheets," and reduces the "Net amounts" presented. Where a legal opinion has not been either sought or obtained, the securities financing balances are presented gross in the "Net amounts" below.

December 31, (in millions)	2019				
	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets <sup>(b)</sup>	Net amounts <sup>(c)</sup>
<b>Assets</b>					
Securities purchased under resale agreements	\$ 434,716	\$ (223,330)	\$ 211,386	\$ (197,430)	\$ 13,956
Securities borrowed	40,100	(1,324)	38,776	(33,840)	4,936
<b>Liabilities</b>					
Securities sold under repurchase agreements	\$ 301,127	\$ (223,330)	\$ 77,797	\$ (76,487)	\$ 1,310
Securities loaned and other <sup>(a)</sup>	14,557	(1,324)	13,233	(13,211)	22

December 31, (in millions)	2018				
	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets <sup>(b)</sup>	Net amounts <sup>(c)</sup>
<b>Assets</b>					
Securities purchased under resale agreements	\$ 637,731	\$ (362,340)	\$ 275,391	\$ (264,225)	\$ 11,166
Securities borrowed	46,785	(1,450)	45,335	(40,845)	4,490
<b>Liabilities</b>					
Securities sold under repurchase agreements	\$ 457,084	\$ (362,340)	\$ 94,744	\$ (92,498)	\$ 2,246
Securities loaned and other <sup>(a)</sup>	19,405	(1,450)	17,955	(17,530)	425

- (a) Includes securities-for-securities lending agreements of \$6.5 billion and \$5.8 billion at December 31, 2019 and 2018, respectively, accounted for at fair value, where the Bank is acting as lender. In the Consolidated balance sheets, the Bank recognizes the securities received at fair value within other assets and the obligation to return those securities within accounts payable and other liabilities.
- (b) In some cases, collateral exchanged with a counterparty exceeds the net asset or liability balance with that counterparty. In such cases, the amounts reported in this column are limited to the related net asset or liability with that counterparty.
- (c) Includes securities financing agreements that provide collateral rights, but where an appropriate legal opinion with respect to the master netting agreement has not been either sought or obtained. At December 31, 2019 and 2018, included \$10.2 billion and \$7.4 billion, respectively, of securities purchased under resale agreements; \$3.9 billion and \$4.0 billion, respectively, of securities borrowed; \$372 million and \$1.1 billion, respectively, of securities sold under repurchase agreements; and zero and \$66 million, respectively, of securities loaned and other.

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The tables below present as of December 31, 2019, and 2018 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

December 31, (in millions)	Gross liability balance			
	2019		2018	
	Securities sold under repurchase agreements	Securities loaned and other	Securities sold under repurchase agreements	Securities loaned and other
Mortgage-backed securities:				
U.S. GSEs and government agencies	\$ 2,850	\$ —	\$ 2,129	\$ —
Residential - nonagency	97	—	—	—
Commercial - nonagency	—	—	2	—
U.S. Treasury, GSEs and government agencies	141,705	6,310	288,240	5,449
Obligations of U.S. states and municipalities	—	—	—	—
Non-U.S. government debt	149,141	1,580	157,252	4,563
Corporate debt securities	7,293	299	8,883	455
Asset-backed securities	41	—	228	—
Equity securities	—	6,368	350	8,938
<b>Total</b>	<b>\$ 301,127</b>	<b>\$ 14,557</b>	<b>\$ 457,084</b>	<b>\$ 19,405</b>

2019 (in millions)	Remaining contractual maturity of the agreements				
	Overnight and continuous	Up to 30 days	30 - 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	\$ 106,463	\$ 127,504	\$ 46,732	\$ 20,428	\$ 301,127
Total securities loaned and other	9,586	3,104	189	1,678	14,557

2018 (in millions)	Remaining contractual maturity of the agreements				
	Overnight and continuous	Up to 30 days	30 - 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	\$ 116,327	\$ 208,310	\$ 85,876	\$ 46,571	\$ 457,084
Total securities loaned and other	16,414	635	9	2,347	19,405

### Transfers not qualifying for sale accounting

At December 31, 2019 and 2018, the Bank held \$743 million and \$2.1 billion, respectively, of financial assets for which the rights have been transferred to third parties; however, the transfers did not qualify as a sale in accordance with U.S. GAAP. These transfers have been recognized as collateralized financing transactions. The transferred assets are recorded in trading assets and loans, and the corresponding liabilities are recorded predominantly in short-term borrowings on the Consolidated balance sheets.

## Note 13 – Loans

### Loan accounting framework

The accounting for a loan depends on management's strategy for the loan, and on whether the loan was credit-impaired at the date of acquisition. The Bank accounts for loans based on the following categories:

- Originated or purchased loans held-for-investment (i.e., “retained”), other than PCI loans
- Loans held-for-sale
- Loans at fair value
- PCI loans held-for-investment

The following provides a detailed accounting discussion of these loan categories:

#### **Loans held-for-investment (other than PCI loans)**

Originated or purchased loans held-for-investment, other than PCI loans, are recorded at the principal amount outstanding, net of the following: charge-offs; interest applied to principal (for loans accounted for on the cost recovery method); unamortized discounts and premiums; and net deferred loan fees or costs. Credit card loans also include billed finance charges and fees net of an allowance for uncollectible amounts.

#### *Interest income*

Interest income on performing loans held-for-investment, other than PCI loans, is accrued and recognized as interest income at the contractual rate of interest. Purchase price discounts or premiums, as well as net deferred loan fees or costs, are amortized into interest income over the contractual life of the loan as an adjustment of yield.

#### *Nonaccrual loans*

Nonaccrual loans are those on which the accrual of interest has been suspended. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status and considered nonperforming when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest has been in default for a period of 90 days or more, unless the loan is both well-secured and in the process of collection. A loan is determined to be past due when the minimum payment is not received from the borrower by the contractually specified due date or for certain loans (e.g., residential real estate loans), when a monthly payment is due and unpaid for 30 days or more. Finally, collateral-dependent loans are typically maintained on nonaccrual status.

On the date a loan is placed on nonaccrual status, all interest accrued but not collected is reversed against interest income. In addition, the amortization of deferred amounts is suspended. Interest income on nonaccrual loans may be recognized as cash interest payments are received (i.e., on a cash basis) if the recorded loan balance is deemed fully collectible; however, if there is doubt regarding the ultimate collectibility of the recorded loan

balance, all interest cash receipts are applied to reduce the carrying value of the loan (the cost recovery method). For consumer loans, application of this policy typically results in the Bank recognizing interest income on nonaccrual consumer loans on a cash basis.

A loan may be returned to accrual status when repayment is reasonably assured and there has been demonstrated performance under the terms of the loan or, if applicable, the terms of the restructured loan.

As permitted by regulatory guidance, credit card loans are generally exempt from being placed on nonaccrual status; accordingly, interest and fees related to credit card loans continue to accrue until the loan is charged off or paid in full. The Bank separately establishes an allowance, which reduces loans and is charged to interest income, for the estimated uncollectible portion of accrued and billed interest and fee income on credit card loans.

#### *Allowance for loan losses*

The allowance for loan losses represents the estimated probable credit losses inherent in the held-for-investment loan portfolio at the balance sheet date and is recognized on the balance sheet as a contra asset, which brings the recorded investment to the net carrying value. Changes in the allowance for loan losses are recorded in the provision for credit losses on the Bank's Consolidated statements of income. Refer to Note 14 for further information on the Bank's accounting policies for the allowance for loan losses.

#### *Charge-offs*

Consumer loans, other than risk-rated business banking and auto loans, and PCI loans, are generally charged off or charged down to the net realizable value of the underlying collateral (i.e., fair value less costs to sell), with an offset to the allowance for loan losses, upon reaching specified stages of delinquency in accordance with standards established by the Federal Financial Institutions Examination Council (“FFIEC”). Residential real estate loans and non-modified credit card loans are generally charged off no later than 180 days past due. Scored auto and modified credit card loans are charged off no later than 120 days past due.

Certain consumer loans will be charged off or charged down to their net realizable value earlier than the FFIEC charge-off standards in certain circumstances as follows:

- Loans modified in a troubled debt restructuring (“TDR”) that are determined to be collateral-dependent.
- Loans to borrowers who have experienced an event that suggests a loss is either known or highly certain are subject to accelerated charge-off standards (e.g., residential real estate and auto loans are charged off within 60 days of receiving notification of a bankruptcy filing).

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- Auto loans upon repossession of the automobile.

Other than in certain limited circumstances, the Bank typically does not recognize charge-offs on government-guaranteed loans.

Wholesale loans, risk-rated business banking loans and risk-rated auto loans are charged off when it is highly certain that a loss has been realized, including situations where a loan is determined to be both impaired and collateral-dependent. The determination of whether to recognize a charge-off includes many factors, including the prioritization of the Bank's claim in bankruptcy, expectations of the workout/restructuring of the loan and valuation of the borrower's equity or the loan collateral.

When a loan is charged down to the estimated net realizable value, the determination of the fair value of the collateral depends on the type of collateral (e.g., securities, real estate). In cases where the collateral is in the form of liquid securities, the fair value is based on quoted market prices or broker quotes. For illiquid securities or other financial assets, the fair value of the collateral is generally estimated using a discounted cash flow model.

For residential real estate loans, collateral values are based upon external valuation sources. When it becomes likely that a borrower is either unable or unwilling to pay, the Bank utilizes a broker's price opinion, appraisal and/or an automated valuation model of the home based on an exterior-only valuation ("exterior opinions"), which is then updated at least every twelve months, or more frequently depending on various market factors. As soon as practicable after the Bank receives the property in satisfaction of a debt (e.g., by taking legal title or physical possession), the Bank generally obtains an appraisal based on an inspection that includes the interior of the home ("interior appraisals"). Exterior opinions and interior appraisals are discounted based upon the Bank's experience with actual liquidation values as compared with the estimated values provided by exterior opinions and interior appraisals, considering state-specific factors.

For commercial real estate loans, collateral values are generally based on appraisals from internal and external valuation sources. Collateral values are typically updated every six to twelve months, either by obtaining a new appraisal or by performing an internal analysis, in accordance with the Bank's policies. The Bank also considers both borrower- and market-specific factors, which may result in obtaining appraisal updates or broker price opinions at more frequent intervals.

### ***Loans held-for-sale***

Loans held-for-sale are measured at the lower of cost or fair value, with valuation changes recorded in noninterest revenue. For consumer loans, the valuation is performed on a portfolio basis. For wholesale loans, the valuation is performed on an individual loan basis.

Interest income on loans held-for-sale is accrued and recognized based on the contractual rate of interest.

Loan origination fees or costs and purchase price discounts or premiums are deferred in a contra loan account until the related loan is sold. The deferred fees or costs and discounts or premiums are an adjustment to the basis of the loan and therefore are included in the periodic determination of the lower of cost or fair value adjustments and/or the gain or loss recognized at the time of sale.

Because these loans are recognized at the lower of cost or fair value, the Bank's allowance for loan losses and charge-off policies do not apply to these loans. However, loans held-for-sale are subject to the nonaccrual policies described above.

### ***Loans at fair value***

Loans used in a market-making strategy or risk managed on a fair value basis are measured at fair value, with changes in fair value recorded in noninterest revenue.

Interest income on these loans is accrued and recognized based on the contractual rate of interest. Changes in fair value are recognized in noninterest revenue. Loan origination fees are recognized upfront in noninterest revenue. Loan origination costs are recognized in the associated expense category as incurred.

Because these loans are recognized at fair value, the Bank's allowance for loan losses and charge-off policies do not apply to these loans. However, loans at fair value are subject to the nonaccrual policies described above.

Refer to Note 4 for further information on the Bank's elections of fair value accounting under the fair value option. Refer to Note 3 and Note 4 for further information on loans carried at fair value and classified as trading assets.

### ***PCI loans***

PCI loans held-for-investment are initially measured at fair value. PCI loans have evidence of credit deterioration since the loan's origination date and therefore it is probable, at acquisition, that all contractually required payments will not be collected. Because PCI loans are initially measured at fair value, which includes an estimate of future credit losses, no allowance for loan losses related to PCI loans is recorded at the acquisition date. Refer to page 81 of this Note for information on accounting for PCI loans subsequent to their acquisition.

### Loan classification changes

Loans in the held-for-investment portfolio that management decides to sell are transferred to the held-for-sale portfolio at the lower of cost or fair value on the date of transfer. Credit-related losses are charged against the allowance for loan losses; non-credit related losses such as those due to changes in interest rates or foreign currency exchange rates are recognized in noninterest revenue.

In the event that management decides to retain a loan in the held-for-sale portfolio, the loan is transferred to the held-for-investment portfolio at the lower of cost or fair value on the date of transfer. These loans are subsequently assessed for impairment based on the Bank's allowance methodology. Refer to Note 14 for a further discussion of the methodologies used in establishing the Bank's allowance for loan losses.

### Loan modifications

The Bank seeks to modify certain loans in conjunction with its loss-mitigation activities. Through the modification, the Bank grants one or more concessions to a borrower who is experiencing financial difficulty in order to minimize the Bank's economic loss and avoid foreclosure or repossession of the collateral, and to ultimately maximize payments received by the Bank from the borrower. The concessions granted vary by program and by borrower-specific characteristics, and may include interest rate reductions, term extensions, payment deferrals, principal forgiveness, or the acceptance of equity or other assets in lieu of payments.

Such modifications are accounted for and reported as TDRs. A loan that has been modified in a TDR is generally considered to be impaired until it matures, is repaid, or is otherwise liquidated, regardless of whether the borrower performs under the modified terms. In certain limited cases, the effective interest rate applicable to the modified loan is at or above the current market rate at the time of the restructuring. In such circumstances, and assuming that the loan subsequently performs under its modified terms and the Bank expects to collect all contractual principal and interest cash flows, the loan is disclosed as impaired and as a TDR only during the year of the modification; in subsequent years, the loan is not disclosed as an impaired loan or as a TDR so long as repayment of the restructured loan under its modified terms is reasonably assured.

Loans, except for credit card loans, modified in a TDR are generally placed on nonaccrual status, although in many cases such loans were already on nonaccrual status prior to modification. These loans may be returned to performing status (the accrual of interest is resumed) if the following criteria are met: (i) the borrower has performed under the modified terms for a minimum of six months and/or six payments, and (ii) the Bank has an expectation that repayment of the modified loan is reasonably assured based on, for example, the borrower's debt capacity and level of future earnings, collateral values, LTV ratios, and other current market considerations. In certain limited and well-defined circumstances in which the loan is current at the modification date, such loans are not placed on nonaccrual status at the time of modification.

Because loans modified in TDRs are considered to be impaired, these loans are measured for impairment using the Bank's established asset-specific allowance methodology, which considers the expected re-default rates for the modified loans. A loan modified in a TDR generally remains subject to the asset-specific allowance methodology throughout its remaining life, regardless of whether the loan is performing and has been returned to accrual status and/or the loan has been removed from the impaired loans disclosures (i.e., loans restructured at market rates). Refer to Note 14 for further discussion of the methodology used to estimate the Bank's asset-specific allowance.

### Foreclosed property

The Bank acquires property from borrowers through loan restructurings, workouts, and foreclosures. Property acquired may include real property (e.g., residential real estate, land, and buildings) and commercial and personal property (e.g., automobiles, aircraft, railcars, and ships).

The Bank recognizes foreclosed property upon receiving assets in satisfaction of a loan (e.g., by taking legal title or physical possession). For loans collateralized by real property, the Bank generally recognizes the asset received at foreclosure sale or upon the execution of a deed in lieu of foreclosure transaction with the borrower. Foreclosed assets are reported in other assets on the Consolidated balance sheets and initially recognized at fair value less costs to sell. Each quarter the fair value of the acquired property is reviewed and adjusted, if necessary, to the lower of cost or fair value. Subsequent adjustments to fair value are charged/credited to noninterest revenue. Operating expense, such as real estate taxes and maintenance, are charged to other expense.

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### Loan portfolio

The Bank's loan portfolio is divided into three portfolio segments, which are the same segments used by the Bank to determine the allowance for loan losses: Consumer, excluding credit card; Credit card; and Wholesale. Within each portfolio segment the Bank monitors and assesses the credit risk in the following classes of loans, based on the risk characteristics of each loan class.

Consumer, excluding credit card	Credit card	Wholesale <sup>(e)</sup>
<u>Residential real estate – excluding PCI</u> <ul style="list-style-type: none"> <li>• Residential mortgage<sup>(a)</sup></li> <li>• Home equity<sup>(b)</sup></li> </ul> <u>Other consumer loans<sup>(c)</sup></u> <ul style="list-style-type: none"> <li>• Auto</li> <li>• Consumer &amp; Business Banking<sup>(d)</sup></li> </ul> <u>Residential real estate – PCI</u> <ul style="list-style-type: none"> <li>• Home equity</li> <li>• Prime mortgage</li> <li>• Subprime mortgage</li> <li>• Option ARMs</li> </ul>	<ul style="list-style-type: none"> <li>• Credit card loans</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial and industrial</li> <li>• Real estate</li> <li>• Financial institutions</li> <li>• Governments &amp; Agencies</li> <li>• Other<sup>(f)</sup></li> </ul>

(a) Predominantly includes prime loans (including option ARMs).

(b) Includes senior and junior lien home equity loans.

(c) Includes certain business banking and auto dealer risk-rated loans for which the wholesale methodology is applied for determining the allowance for loan losses and therefore, for consistency in presentation, are included with the other consumer loan classes.

(d) Predominantly includes business banking loans.

(e) Classes are internally defined and may not align with regulatory definitions.

(f) Includes loans to: individuals and individual entities (predominantly consists of wealth management clients and includes loans to personal investment companies and personal and testamentary trusts), SPEs and Private education and civic organizations. Refer to Note 15 for more information on SPEs.

The following tables summarize the Bank's loan balances by portfolio segment.

December 31, 2019 (in millions)	Consumer, excluding credit card	Credit card <sup>(a)</sup>	Wholesale	Total
Retained	\$ 331,895	\$ 168,924	\$ 443,240	\$ 944,059
Held-for-sale	3,002	–	4,050	7,052
At fair value	–	–	7,104	7,104
<b>Total</b>	<b>\$ 334,897</b>	<b>\$ 168,924</b>	<b>\$ 454,394</b>	<b>\$ 958,215</b>

December 31, 2018 (in millions)	Consumer, excluding credit card	Credit card <sup>(a)</sup>	Wholesale	Total
Retained	\$ 373,609	\$ 156,616	\$ 437,769	\$ 967,994
Held-for-sale	95	16	11,877	11,988
At fair value	–	–	3,151	3,151
<b>Total</b>	<b>\$ 373,704</b>	<b>\$ 156,632</b>	<b>\$ 452,797</b>	<b>\$ 983,133</b>

(a) Includes accrued interest and fees net of an allowance for the uncollectible portion of accrued interest and fee income.

(b) Loans (other than PCI loans and those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2019 and 2018.

The following tables provide information about the carrying value of retained loans purchased, sold and reclassified to held-for-sale during the periods indicated. Reclassifications of loans to held-for sale are non-cash transactions. The Bank manages its exposure to credit risk on an ongoing basis. Selling loans is one way that the Bank reduces its credit exposures. Loans that were reclassified to held-for-sale and sold in a subsequent period are excluded from the sales line of this table.

Year ended December 31, (in millions)	2019			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	\$ 1,282 <sup>(a)(b)</sup>	\$ —	\$ 1,291	\$ 2,573
Sales	30,484	—	23,435	53,919
Retained loans reclassified to held-for-sale	9,188	—	2,371	11,559

Year ended December 31, (in millions)	2018			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	\$ 2,543 <sup>(a)(b)</sup>	\$ —	\$ 2,354	\$ 4,897
Sales	9,984	—	16,757	26,741
Retained loans reclassified to held-for-sale	36	—	2,276	2,312

Year ended December 31, (in millions)	2017			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	\$ 3,461 <sup>(a)(b)</sup>	\$ —	\$ 1,799	\$ 5,260
Sales	3,405	—	11,063	14,468
Retained loans reclassified to held-for-sale	6,340 <sup>(c)</sup>	—	1,229	7,569

- (a) Purchases predominantly represent the Bank's voluntary repurchase of certain delinquent loans from loan pools as permitted by Government National Mortgage Association ("Ginnie Mae") guidelines. The Bank typically elects to repurchase these delinquent loans as it continues to service them and/or manage the foreclosure process in accordance with applicable requirements of Ginnie Mae, the Federal Housing Administration ("FHA"), Rural Housing Service ("RHS") and/or the U.S. Department of Veterans Affairs ("VA").
- (b) Excludes purchases of retained loans sourced through the correspondent origination channel and underwritten in accordance with the Bank's standards. Such purchases were \$16.6 billion, \$18.6 billion and \$23.5 billion for the years ended December 31, 2019, 2018 and 2017, respectively.
- (c) Includes the Bank's student loan portfolio which was sold in 2017.

### Gains and losses on sales of loans

Net gains on sales of loans (including adjustments to record loans held-for-sale at the lower of cost or fair value) recognized in noninterest revenue was \$386 million for the year ended December 31, 2019. Gains and losses on sales of loans were not material for the years ended December 31, 2018 and 2017. In addition, the sale of loans may also result in write downs, recoveries or changes in the allowance recognized in the provision for credit losses.

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### Consumer, excluding credit card, loan portfolio

Consumer loans, excluding credit card loans, consist primarily of residential mortgages, home equity loans and lines of credit, auto loans and consumer and business banking loans, with a focus on serving the prime consumer credit market. The portfolio also includes home equity loans secured by junior liens, prime mortgage loans with an interest-only payment period, and certain payment-option loans that may result in negative amortization.

The following table provides information about retained consumer loans, excluding credit card, by class.

December 31, (in millions)	2019	2018
<b>Residential real estate – excluding PCI</b>		
Residential mortgage	\$ 199,018	\$ 231,054
Home equity	23,917	28,336
<b>Other consumer loans</b>		
Auto	61,522	63,573
Consumer & business banking	27,075	26,612
<b>Residential real estate – PCI</b>		
Home equity	7,377	8,963
Prime mortgage	3,965	4,690
Subprime mortgage	1,740	1,945
Option ARMs	7,281	8,436
<b>Total retained loans</b>	<b>\$ 331,895</b>	<b>\$ 373,609</b>

Delinquency rates are a primary credit quality indicator for consumer loans. Loans that are more than 30 days past due provide an early warning of borrowers who may be experiencing financial difficulties and/or who may be unable or unwilling to repay the loan. As the loan continues to age, it becomes more clear whether the borrower is likely either unable or unwilling to pay. In the case of residential real estate loans, late-stage delinquencies (greater than 150 days past due) are a strong indicator of loans that will ultimately result in a foreclosure or similar liquidation transaction. In addition to delinquency rates, other credit quality indicators for consumer loans vary based on the class of loan, as follows:

- For residential real estate loans, including both non-PCI and PCI portfolios, the current estimated LTV ratio, or the combined LTV ratio in the case of junior lien loans, is an indicator of the potential loss severity in the event of default. Additionally, LTV or combined LTV ratios can provide insight into a borrower's continued willingness to pay, as the delinquency rate of high-LTV loans tends to be greater than that for loans where the borrower has equity in the collateral. The geographic distribution of the loan collateral also provides insight as to the credit quality of the portfolio, as factors such as the regional economy, home price changes and specific events such as natural disasters, will affect credit quality. The borrower's current or "refreshed" FICO score is a secondary credit quality indicator for certain loans, as FICO scores are an indication of the borrower's credit payment history. Thus, a loan to a borrower with a low FICO score (less than 660) is considered to be of higher risk than a loan to a borrower with a higher FICO score. Further, a loan to a borrower with a high LTV ratio and a low FICO score is at greater risk of default than a loan to a borrower that has both a high LTV ratio and a high FICO score.
- For scored auto and scored business banking loans, geographic distribution is an indicator of the credit performance of the portfolio. Similar to residential real estate loans, geographic distribution provides insights into the portfolio performance based on regional economic activity and events.
- Risk-rated business banking and auto loans are similar to wholesale loans in that the primary credit quality indicators are the internal risk ratings that are assigned to the loan and whether the loans are considered to be criticized and/or nonaccrual. Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information about borrowers' ability to fulfill their obligations. Refer to page 86 of this Note for further information about risk-rated wholesale loan credit quality indicators.

## Residential real estate – excluding PCI loans

The following table provides information by class for retained residential real estate – excluding PCI loans.

### Residential real estate – excluding PCI loans

December 31, (in millions, except ratios)	Residential mortgage		Home equity		Total residential real estate - excluding PCI	
	2019	2018	2019	2018	2019	2018
<b>Loan delinquency<sup>(a)</sup></b>						
Current	\$ 198,007	\$ 225,880	\$ 23,385	\$ 27,607	\$ 221,392	\$ 253,487
30-149 days past due	602	2,760	336	453	938	3,213
150 or more days past due	409	2,414	196	276	605	2,690
<b>Total retained loans</b>	<b>\$ 199,018</b>	<b>\$ 231,054</b>	<b>\$ 23,917</b>	<b>\$ 28,336</b>	<b>\$ 222,935</b>	<b>\$ 259,390</b>
% of 30+ days past due to total retained loans <sup>(b)</sup>	0.49%	0.48%	2.22%	2.57%	0.67%	0.71%
90 or more days past due and government guaranteed <sup>(c)</sup>	\$ 37	\$ 2,539	\$ –	\$ –	\$ 37	\$ 2,539
Nonaccrual loans	1,615	1,763	1,162	1,323	2,777	3,086
<b>Current estimated LTV ratios<sup>(d)(e)</sup></b>						
Greater than 125% and refreshed FICO scores:						
Equal to or greater than 660	\$ 18	\$ 25	\$ 4	\$ 6	\$ 22	\$ 31
Less than 660	8	13	1	1	9	14
101% to 125% and refreshed FICO scores:						
Equal to or greater than 660	31	37	56	111	87	148
Less than 660	35	53	19	37	54	90
80% to 100% and refreshed FICO scores:						
Equal to or greater than 660	5,013	3,977	606	985	5,619	4,962
Less than 660	206	281	191	326	397	607
Less than 80% and refreshed FICO scores:						
Equal to or greater than 660	186,968	212,499	19,597	22,630	206,565	235,129
Less than 660	5,998	6,453	2,776	3,355	8,774	9,808
No FICO/LTV available	687	810	667	885	1,354	1,695
U.S. government-guaranteed	54	6,906	–	–	54	6,906
<b>Total retained loans</b>	<b>\$ 199,018</b>	<b>\$ 231,054</b>	<b>\$ 23,917</b>	<b>\$ 28,336</b>	<b>\$ 222,935</b>	<b>\$ 259,390</b>
<b>Geographic region<sup>(f)</sup></b>						
California	\$ 66,278	\$ 74,758	\$ 4,831	\$ 5,694	\$ 71,109	\$ 80,452
New York	25,704	28,845	4,885	5,768	30,589	34,613
Illinois	13,204	15,249	1,788	2,130	14,992	17,379
Texas	12,600	13,768	1,599	1,819	14,199	15,587
Florida	10,453	10,703	1,325	1,575	11,778	12,278
Washington	7,708	8,304	720	869	8,428	9,173
Colorado	7,777	8,140	444	521	8,221	8,661
New Jersey	5,792	7,301	1,394	1,641	7,186	8,942
Massachusetts	5,596	6,574	202	236	5,798	6,810
Arizona	3,929	4,433	932	1,158	4,861	5,591
All other <sup>(g)</sup>	39,977	52,979	5,797	6,925	45,774	59,904
<b>Total retained loans</b>	<b>\$ 199,018</b>	<b>\$ 231,054</b>	<b>\$ 23,917</b>	<b>\$ 28,336</b>	<b>\$ 222,935</b>	<b>\$ 259,390</b>

- (a) Individual delinquency classifications include mortgage loans insured by U.S. government agencies as follows: current included \$10 million and \$2.8 billion; 30-149 days past due included \$18 million and \$2.1 billion; and 150 or more days past due included \$26 million and \$2.0 billion at December 31, 2019 and 2018, respectively.
- (b) At December 31, 2019 and 2018, residential mortgage loans excluded mortgage loans insured by U.S. government agencies of \$44 million and \$4.1 billion, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.
- (c) These balances are excluded from nonaccrual loans as the loans are guaranteed by U.S. government agencies. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting agreed-upon servicing guidelines. At December 31, 2019, and 2018, these balances included \$33 million and \$997 million, respectively, of loans that are no longer accruing interest based on the agreed-upon servicing guidelines. For the remaining balance, interest is being accrued at the guaranteed reimbursement rate. There were no loans that were not guaranteed by U.S. government agencies that are 90 or more days past due and still accruing interest at December 31, 2019 and 2018.
- (d) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. These property values do not represent actual appraised loan level collateral values; as such, the resulting ratios are necessarily imprecise and should be viewed as estimates. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.
- (e) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Bank on at least a quarterly basis.
- (f) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2019.
- (g) At December 31, 2019 and 2018, included mortgage loans insured by U.S. government agencies of \$54 million and \$6.9 billion, respectively. These amounts have been excluded from the geographic regions presented based upon the government guarantee.

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Approximately 37% of the home equity portfolio are senior lien loans; the remaining balance are junior lien HELOANS or HELOCs. The following table provides the Bank's delinquency statistics for junior lien home equity loans and lines as of December 31, 2019 and 2018.

December 31, (in millions, except ratios)	Total loans		Total 30+ day delinquency rate	
	2019	2018	2019	2018
HELOCs: <sup>(a)</sup>				
Within the revolving period <sup>(b)</sup>	\$ 5,488	\$ 5,606	0.35%	0.25%
Beyond the revolving period	8,724	11,283	2.48	2.80
HELOANS	754	1,030	2.52	2.82
<b>Total</b>	<b>\$ 14,966</b>	<b>\$ 17,919</b>	<b>1.70%</b>	<b>2.00%</b>

- (a) These HELOCs are predominantly revolving loans for a 10-year period, after which time the HELOC converts to a loan with a 20-year amortization period, but also include HELOCs that allow interest-only payments beyond the revolving period.  
(b) The Bank manages the risk of HELOCs during their revolving period by closing or reducing the undrawn line to the extent permitted by law when borrowers are experiencing financial difficulty.

HELOCs beyond the revolving period and HELOANS have higher delinquency rates than HELOCs within the revolving period. That is primarily because the fully-amortizing payment that is generally required for those products is higher than the minimum payment options available for HELOCs within the revolving period. The higher delinquency rates associated with amortizing HELOCs and HELOANS are factored into the Bank's allowance for loan losses.

### Impaired loans

The table below provides information about the Bank's residential real estate impaired loans, excluding PCI loans. These loans are considered to be impaired as they have been modified in a TDR. All impaired loans are evaluated for an asset-specific allowance as described in Note 14.

December 31, (in millions)	Residential mortgage		Home equity		Total residential real estate - excluding PCI	
	2019	2018	2019	2018	2019	2018
<b>Impaired loans</b>						
With an allowance	\$ 2,847	\$ 3,376	\$ 1,042	\$ 1,151	\$ 3,889	\$ 4,527
Without an allowance <sup>(a)</sup>	1,152	1,182	879	907	2,031	2,089
<b>Total impaired loans<sup>(b)(c)</sup></b>	<b>\$ 3,999</b>	<b>\$ 4,558</b>	<b>\$ 1,921</b>	<b>\$ 2,058</b>	<b>\$ 5,920</b>	<b>\$ 6,616</b>
Allowance for loan losses related to impaired loans	\$ 52	\$ 88	\$ 13	\$ 45	\$ 65	\$ 133
Unpaid principal balance of impaired loans <sup>(d)</sup>	5,430	6,198	3,301	3,531	8,731	9,729
Impaired loans on nonaccrual status <sup>(e)</sup>	1,364	1,457	965	963	2,329	2,420

- (a) Represents collateral-dependent residential real estate loans that are charged off to the fair value of the underlying collateral less costs to sell. The Bank reports, in accordance with regulatory guidance, residential real estate loans that have been discharged under Chapter 7 bankruptcy and not reaffirmed by the borrower ("Chapter 7 loans") as collateral-dependent nonaccrual TDRs, regardless of their delinquency status. At December 31, 2019, Chapter 7 residential real estate loans included approximately 9% of residential mortgages and approximately 7% of home equity that were 30 days or more past due.  
(b) At December 31, 2019 and 2018, \$8 million and \$4.1 billion, respectively, of loans modified subsequent to repurchase from Ginnie Mae in accordance with the standards of the appropriate government agency (i.e., FHA, VA, RHS) are not included in the table above. When such loans perform subsequent to modification in accordance with Ginnie Mae guidelines, they are generally sold back into Ginnie Mae loan pools. Modified loans that do not re-perform become subject to foreclosure.  
(c) Predominantly all impaired loans in the table above are in the U.S.  
(d) Represents the contractual amount of principal owed at December 31, 2019 and 2018. The unpaid principal balance differs from the impaired loan balances due to various factors including charge-offs, net deferred loan fees or costs, and unamortized discounts or premiums on purchased loans.  
(e) As of December 31, 2019 and 2018, nonaccrual loans included \$1.9 billion and \$2.0 billion, respectively, of TDRs for which the borrowers were less than 90 days past due. Refer to the Loan accounting framework on pages 69-71 of this Note for additional information about loans modified in a TDR that are on nonaccrual status.

The following table presents average impaired loans and the related interest income reported by the Bank.

Year ended December 31, (in millions)	Average impaired loans			Interest income on impaired loans <sup>(a)</sup>			Interest income on impaired loans on a cash basis <sup>(a)</sup>		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Residential mortgage	\$ 4,301	\$ 5,075	\$ 5,789	\$ 224	\$ 257	\$ 287	\$ 68	\$ 75	\$ 75
Home equity	2,007	2,123	2,222	132	131	127	83	84	80
<b>Total residential real estate - excluding PCI</b>	<b>\$ 6,308</b>	<b>\$ 7,198</b>	<b>\$ 8,011</b>	<b>\$ 356</b>	<b>\$ 388</b>	<b>\$ 414</b>	<b>\$ 151</b>	<b>\$ 159</b>	<b>\$ 155</b>

(a) Generally, interest income on loans modified in TDRs is recognized on a cash basis until the borrower has made a minimum of six payments under the new terms, unless the loan is deemed to be collateral-dependent.

### Loan modifications

Modifications of residential real estate loans, excluding PCI loans, are generally accounted for and reported as TDRs. There were no additional commitments to lend to borrowers whose residential real estate loans, excluding PCI loans, have been modified in TDRs.

The following table presents new TDRs reported by the Bank.

Year ended December 31, (in millions)	2019	2018	2017
Residential mortgage	\$ 234	\$ 400	\$ 373
Home equity	256	335	383
<b>Total residential real estate - excluding PCI</b>	<b>\$ 490</b>	<b>\$ 735</b>	<b>\$ 756</b>

### Nature and extent of modifications

The Bank's proprietary modification programs as well as government programs, including U.S. GSEs, generally provide various concessions to financially troubled borrowers including, but not limited to, interest rate reductions, term or payment extensions and deferral of principal and/or interest payments that would otherwise have been required under the terms of the original agreement.

The following table provides information about how residential real estate loans, excluding PCI loans, were modified under the Bank's loss mitigation programs described above during the periods presented. This table excludes Chapter 7 loans where the sole concession granted is the discharge of debt.

Year ended December 31,	Residential mortgage			Home equity			Total residential real estate - excluding PCI		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Number of loans approved for a trial modification	2,102	2,558	1,281	3,767	4,605	5,765	5,869	7,163	7,046
Number of loans permanently modified	1,447	2,900	2,624	3,470	4,946	5,624	4,917	7,846	8,248
<b>Concession granted:<sup>(a)</sup></b>									
Interest rate reduction	66%	40%	63%	81%	62%	59%	77%	54%	60%
Term or payment extension	90	55	72	64	66	69	71	62	70
Principal and/or interest deferred	26	44	15	7	20	10	13	29	12
Principal forgiveness	6	8	16	5	7	13	5	7	14
Other <sup>(b)</sup>	45	38	33	70	58	31	63	51	32

(a) Represents concessions granted in permanent modifications as a percentage of the number of loans permanently modified. The sum of the percentages exceeds 100% because predominantly all of the modifications include more than one type of concession. Concessions offered on trial modifications are generally consistent with those granted on permanent modifications.

(b) Includes variable interest rate to fixed interest rate modifications for the years ended December 31, 2019, 2018 and 2017. Also includes forbearances that meet the definition of a TDR for the years ended December 31, 2019 and 2018. Forbearances suspend or reduce monthly payments for a specific period of time to address a temporary hardship.

(c) The prior period amounts have been revised to conform with the current period presentation. This revision also impacted home equity impaired loans and new TDRs in this note, as well as loans by impairment methodology in Note 14.

## Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
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### Financial effects of modifications and redefaults

The following table provides information about the financial effects of the various concessions granted in modifications of residential real estate loans, excluding PCI, under the loss mitigation programs described above and about redefaults of certain loans modified in TDRs for the periods presented. The following table presents only the financial effects of permanent modifications and does not include temporary concessions offered through trial modifications. This table also excludes Chapter 7 loans where the sole concession granted is the discharge of debt.

Year ended December 31, (in millions, except weighted-average data)	Residential mortgage			Home equity			Total residential real estate - excluding PCI		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Weighted-average interest rate of loans with interest rate reductions - before TDR	5.88%	5.65%	5.15%	5.53%	5.39%	4.95%	5.67%	5.50%	5.06%
Weighted-average interest rate of loans with interest rate reductions - after TDR	4.21	3.80	2.99	3.53	3.46	2.64	3.81	3.60	2.83
Weighted-average remaining contractual term (in years) of loans with term or payment extensions - before TDR	20	23	24	19	19	21	20	21	23
Weighted-average remaining contractual term (in years) of loans with term or payment extensions - after TDR	39	38	38	40	39	39	39	38	38
Charge-offs recognized upon permanent modification	\$ 1	\$ 1	\$ 2	\$ -	\$ 1	\$ 1	\$ 1	\$ 2	\$ 3
Principal deferred	15	21	12	4	9	10	19	30	22
Principal forgiven	4	10	20	3	7	13	7	17	33
Balance of loans that redefaulted within one year of permanent modification <sup>(a)</sup>	\$ 107	\$ 97	\$ 124	\$ 59	\$ 63	\$ 56	\$ 166	\$ 160	\$ 180

(a) Represents loans permanently modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The dollar amounts presented represent the balance of such loans at the end of the reporting period in which such loans defaulted. For residential real estate loans modified in TDRs, payment default is deemed to occur when the loan becomes two contractual payments past due. In the event that a modified loan redefaults, it is probable that the loan will ultimately be liquidated through foreclosure or another similar type of liquidation transaction. Defaults of loans modified within the last 12 months may not be representative of ultimate redefault levels.

At December 31, 2019, the weighted-average estimated remaining lives of residential real estate loans, excluding PCI loans, permanently modified in TDRs were 9 years for residential mortgage and 8 years for home equity. The estimated remaining lives of these loans reflect estimated prepayments, both voluntary and involuntary (i.e., foreclosures and other forced liquidations).

### Active and suspended foreclosure

At December 31, 2019 and 2018, the Bank had non-PCI residential real estate loans, excluding those insured by U.S. government agencies, with a carrying value of \$529 million and \$652 million, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

## Other consumer loans

The table below provides information for other consumer retained loan classes, including auto and business banking loans.

December 31, (in millions, except ratios)	Auto		Consumer & business banking		Total other consumer	
	2019	2018	2019	2018	2019	2018
<b>Loan delinquency</b>						
Current	\$ 60,944	\$ 62,984	\$ 26,718	\$ 26,249	\$ 87,662	\$ 89,233
30-119 days past due	578	589	240	252	818	841
120 or more days past due	—	—	117	111	117	111
<b>Total retained loans</b>	<b>\$ 61,522</b>	<b>\$ 63,573</b>	<b>\$ 27,075</b>	<b>\$ 26,612</b>	<b>\$ 88,597</b>	<b>\$ 90,185</b>
% of 30+ days past due to total retained loans	0.94%	0.93%	1.32%	1.36%	1.06%	1.06%
Nonaccrual loans <sup>(a)</sup>	113	128	247	245	360	373
<b>Geographic region<sup>(b)</sup></b>						
California	\$ 8,081	\$ 8,330	\$ 5,891	\$ 5,520	\$ 13,972	\$ 13,850
Texas	6,804	6,531	3,105	2,993	9,909	9,524
New York	3,639	3,863	4,372	4,381	8,011	8,244
Illinois	3,360	3,716	1,733	2,046	5,093	5,762
Florida	3,262	3,256	1,594	1,502	4,856	4,758
Arizona	2,024	2,084	1,273	1,491	3,297	3,575
Ohio	1,986	1,973	1,137	1,305	3,123	3,278
New Jersey	1,905	1,981	797	723	2,702	2,704
Michigan	1,215	1,357	1,250	1,329	2,465	2,686
Louisiana	1,617	1,587	740	860	2,357	2,447
All other	27,629	28,895	5,183	4,462	32,812	33,357
<b>Total retained loans</b>	<b>\$ 61,522</b>	<b>\$ 63,573</b>	<b>\$ 27,075</b>	<b>\$ 26,612</b>	<b>\$ 88,597</b>	<b>\$ 90,185</b>
<b>Loans by risk ratings<sup>(c)</sup></b>						
Noncriticized	\$ 14,178	\$ 15,749	\$ 19,156	\$ 18,743	\$ 33,334	\$ 34,492
Criticized performing	360	273	727	751	1,087	1,024
Criticized nonaccrual	—	—	198	191	198	191

(a) There were no loans that were 90 or more days past due and still accruing interest at December 31, 2019 and December 31, 2018.

(b) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2019.

(c) For risk-rated business banking and auto loans, the primary credit quality indicator is the internal risk rating of the loan, including whether the loans are considered to be criticized and/or nonaccrual.

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### Other consumer impaired loans and loan modifications

The following table provides information about the Bank's other consumer impaired loans, including risk-rated business banking and auto loans that have been placed on nonaccrual status, and loans that have been modified in TDRs.

December 31, (in millions)	2019	2018
<b>Impaired loans</b>		
With an allowance	\$ 227	\$ 222
Without an allowance <sup>(a)</sup>	19	29
<b>Total impaired loans<sup>(b)(c)</sup></b>	<b>\$ 246</b>	<b>\$ 251</b>
Allowance for loan losses related to impaired loans	\$ 71	\$ 63
Unpaid principal balance of impaired loans <sup>(d)</sup>	342	355
Impaired loans on nonaccrual status	224	229

- (a) When discounted cash flows, collateral value or market price equals or exceeds the recorded investment in the loan, the loan does not require an allowance. This typically occurs when the impaired loans have been partially charged off and/or there have been interest payments received and applied to the loan balance.
- (b) Predominantly all other consumer impaired loans are in the U.S.
- (c) Other consumer average impaired loans were \$246 million, \$275 million and \$427 million for the years ended December 31, 2019, 2018 and 2017, respectively. The related interest income on impaired loans, including those on a cash basis, was not material for the years ended December 31, 2019, 2018 and 2017.
- (d) Represents the contractual amount of principal owed at December 31, 2019 and 2018. The unpaid principal balance differs from the impaired loan balances due to various factors, including charge-offs, interest payments received and applied to the principal balance, net deferred loan fees or costs and unamortized discounts or premiums on purchased loans.

### Loan modifications

Certain other consumer loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. All of these TDRs are reported as impaired loans. At December 31, 2019 and 2018, other consumer loans modified in TDRs were \$76 million and \$79 million, respectively. The impact of these modifications, as well as new TDRs, were not material to the Bank for the years ended December 31, 2019, 2018 and 2017. Additional commitments to lend to borrowers whose loans have been modified in TDRs as of December 31, 2019 and 2018 were not material. TDRs on nonaccrual status were \$54 million and \$57 million at December 31, 2019 and 2018, respectively.

### Purchased credit-impaired loans

PCI loans are initially recorded at fair value at acquisition. PCI loans acquired in the same fiscal quarter may be aggregated into one or more pools, provided that the loans have common risk characteristics. A pool is then accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows. All of the Bank's residential real estate PCI loans were acquired in the same fiscal quarter and aggregated into pools of loans with common risk characteristics.

On a quarterly basis, the Bank estimates the total cash flows (both principal and interest) expected to be collected over the remaining life of each pool. These estimates incorporate assumptions regarding default rates, loss severities, the amounts and timing of prepayments and other factors that reflect then-current market conditions. Probable decreases in expected cash flows (i.e., increased credit losses) trigger the recognition of impairment, which is then measured as the present value of the expected principal loss plus any related forgone interest cash flows, discounted at the pool's effective interest rate. Impairments are recognized through the provision for credit losses and an increase in the allowance for loan losses. Probable and significant increases in expected cash flows (e.g., decreased credit losses, the net benefit of modifications) would first reverse any previously recorded allowance for loan losses with any remaining increases recognized prospectively as a yield adjustment over the remaining estimated lives of the underlying loans. The impacts of (i) prepayments, (ii) changes in variable interest rates, and (iii) any other changes in the timing of expected cash flows are generally recognized prospectively as adjustments to interest income.

The Bank continues to modify certain PCI loans. The impact of these modifications is incorporated into the Bank's quarterly assessment of whether a probable and significant change in expected cash flows has occurred, and the loans continue to be accounted for and reported as PCI loans. In evaluating the effect of modifications on expected cash flows, the Bank incorporates the effect of any forgone interest and also considers the potential for redefault. The Bank develops product-specific probability of default estimates, which are used to compute expected credit losses. In developing these probabilities of default, the Bank considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about home prices and unemployment based upon industry-wide data. The Bank also considers its own historical loss experience to-date based on actual redefaulted modified PCI loans.

The excess of cash flows expected to be collected over the carrying value of the underlying loans is referred to as the accretable yield. This amount is not reported on the Bank's Consolidated balance sheets but is accreted into interest income at a level rate of return over the remaining estimated lives of the underlying pools of loans.

Since the timing and amounts of expected cash flows for the Bank's PCI consumer loan pools are reasonably estimable, interest is being accreted and the loan pools are being reported as performing loans. No interest would be accreted and the PCI loan pools would be reported as nonaccrual loans if the timing and/or amounts of expected cash flows on the loan pools were determined not to be reasonably estimable.

The liquidation of PCI loans, which may include sales of loans, receipt of payment in full from the borrower, or foreclosure, results in removal of the loans from the underlying PCI pool. When the amount of the liquidation proceeds (e.g., cash, real estate), if any, is less than the unpaid principal balance of the loan, the difference is first applied against the PCI pool's nonaccretable difference for principal losses (i.e., the lifetime credit loss estimate established as a purchase accounting adjustment at the acquisition date). When the nonaccretable difference for a particular loan pool has been fully depleted, any excess of the unpaid principal balance of the loan over the liquidation proceeds is written off against the PCI pool's allowance for loan losses. Write-offs of PCI loans also include other adjustments, primarily related to principal forgiveness modifications. Because the Bank's PCI loans are accounted for at a pool level, the Bank does not recognize charge-offs of PCI loans when they reach specified stages of delinquency (i.e., unlike non-PCI consumer loans, these loans are not charged off based on FFIEC standards).

The PCI portfolio affects the Bank's results of operations primarily through: (i) contribution to net interest margin; (ii) expense related to defaults and servicing resulting from the liquidation of the loans; and (iii) any provision for loan losses.

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### Residential real estate – PCI loans

The table below provides information about the Bank's consumer, excluding credit card, PCI loans.

December 31, (in millions, except ratios)	Home equity		Prime mortgage		Subprime mortgage		Option ARMs		Total PCI	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Carrying value <sup>(a)</sup>	\$ 7,377	\$ 8,963	\$ 3,965	\$ 4,690	\$ 1,740	\$ 1,945	\$ 7,281	\$ 8,436	\$20,363	\$24,034
<b>Loan delinquency (based on unpaid principal balance)</b>										
Current	\$ 7,203	\$ 8,624	\$ 3,593	\$ 4,226	\$ 1,864	\$ 2,033	\$ 6,606	\$ 7,592	\$19,266	\$22,475
30–149 days past due	217	278	219	259	230	286	356	398	1,022	1,221
150 or more days past due	148	242	172	223	101	123	333	457	754	1,045
<b>Total loans</b>	<b>\$ 7,568</b>	<b>\$ 9,144</b>	<b>\$ 3,984</b>	<b>\$ 4,708</b>	<b>\$ 2,195</b>	<b>\$ 2,442</b>	<b>\$ 7,295</b>	<b>\$ 8,447</b>	<b>\$21,042</b>	<b>\$24,741</b>
% of 30+ days past due to total loans	4.82%	5.69%	9.81%	10.24%	15.08%	16.75%	9.44%	10.12%	8.44%	9.16%
<b>Current estimated LTV ratios (based on unpaid principal balance)<sup>(b)(c)</sup></b>										
Greater than 125% and refreshed FICO scores:										
Equal to or greater than 660	\$ 12	\$ 17	\$ 2	\$ 1	\$ –	\$ –	\$ 1	\$ 3	\$ 15	\$ 21
Less than 660	9	13	6	7	7	9	7	7	29	36
101% to 125% and refreshed FICO scores:										
Equal to or greater than 660	86	135	3	6	6	4	14	17	109	162
Less than 660	39	65	17	22	20	35	18	33	94	155
80% to 100% and refreshed FICO scores:										
Equal to or greater than 660	588	805	47	75	47	54	85	119	767	1,053
Less than 660	261	388	65	112	100	161	113	190	539	851
Lower than 80% and refreshed FICO scores:										
Equal to or greater than 660	4,803	5,548	2,429	2,689	784	739	4,710	5,111	12,726	14,087
Less than 660	1,562	1,908	1,250	1,568	1,136	1,327	2,093	2,622	6,041	7,425
No FICO/LTV available	208	265	165	228	95	113	254	345	722	951
<b>Total unpaid principal balance</b>	<b>\$ 7,568</b>	<b>\$ 9,144</b>	<b>\$ 3,984</b>	<b>\$ 4,708</b>	<b>\$ 2,195</b>	<b>\$ 2,442</b>	<b>\$ 7,295</b>	<b>\$ 8,447</b>	<b>\$21,042</b>	<b>\$24,741</b>
<b>Geographic region (based on unpaid principal balance)<sup>(d)</sup></b>										
California	\$ 4,475	\$ 5,420	\$ 2,166	\$ 2,578	\$ 531	\$ 593	\$ 4,189	\$ 4,798	\$11,361	\$13,389
Florida	833	976	288	332	212	234	604	713	1,937	2,255
New York	451	525	324	365	245	268	441	502	1,461	1,660
Illinois	200	233	134	154	113	123	175	199	622	709
Washington	326	419	80	98	37	44	143	177	586	738
New Jersey	174	210	112	134	78	88	219	258	583	690
Massachusetts	53	65	97	113	67	73	206	240	423	491
Maryland	40	48	86	95	87	96	157	178	370	417
Virginia	44	54	77	91	33	37	180	211	334	393
Arizona	130	165	57	69	37	43	93	112	317	389
All other	842	1,029	563	679	755	843	888	1,059	3,048	3,610
<b>Total unpaid principal balance</b>	<b>\$ 7,568</b>	<b>\$ 9,144</b>	<b>\$ 3,984</b>	<b>\$ 4,708</b>	<b>\$ 2,195</b>	<b>\$ 2,442</b>	<b>\$ 7,295</b>	<b>\$ 8,447</b>	<b>\$21,042</b>	<b>\$24,741</b>

(a) Carrying value includes the effect of fair value adjustments that were applied to the consumer PCI portfolio at the date of acquisition.

(b) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. These property values do not represent actual appraised loan level collateral values; as such, the resulting ratios are necessarily imprecise and should be viewed as estimates. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.

(c) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Bank on at least a quarterly basis.

(d) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2019.

Approximately 27% of the PCI home equity portfolio are senior lien loans; the remaining balance are junior lien HELOANs or HELOCs. The following table provides delinquency statistics for PCI junior lien home equity loans and lines of credit based on the unpaid principal balance as of December 31, 2019 and 2018.

December 31, (in millions, except ratios)	Total loans		Total 30+ day delinquency rate	
	2019	2018	2019	2018
HELOCs: <sup>(a)(b)</sup>	\$ 5,337	\$ 6,531	3.52%	4.00%
HELOANs	220	280	3.64	3.57
<b>Total</b>	<b>\$ 5,557</b>	<b>\$ 6,811</b>	<b>3.53%</b>	<b>3.98%</b>

(a) In general, these HELOCs are revolving loans for a 10-year period, after which time the HELOC converts to an interest-only loan with a balloon payment at the end of the loan's term. Substantially all HELOCs are beyond the revolving period.

(b) Includes loans modified into fixed rate amortizing loans.

The table below presents the accretable yield activity for the Bank's PCI consumer loans for the years ended December 31, 2019, 2018 and 2017, and represents the Bank's estimate of gross interest income expected to be earned over the remaining life of the PCI loan portfolios. The table excludes the cost to fund the PCI portfolios, and therefore the accretable yield does not represent net interest income expected to be earned on these portfolios.

Year ended December 31, (in millions, except ratios)	Total PCI		
	2019	2018	2017
<b>Beginning balance</b>	\$ 8,422	\$ 11,159	\$ 11,768
Accretion into interest income	(1,093)	(1,249)	(1,396)
Changes in interest rates on variable-rate loans	(575)	(109)	503
Other changes in expected cash flows <sup>(a)</sup>	(589)	(1,379)	284
<b>Balance at December 31</b>	<b>\$ 6,165</b>	<b>\$ 8,422</b>	<b>\$ 11,159</b>
Accretable yield percentage	5.28%	4.92%	4.53%

(a) Other changes in expected cash flows may vary from period to period as the Bank continues to refine its cash flow model, for example cash flows expected to be collected due to the impact of modifications and changes in prepayment assumptions.

### Active and suspended foreclosure

At December 31, 2019 and 2018, the Bank had PCI residential real estate loans with an unpaid principal balance of \$721 million and \$964 million, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

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### Credit card loan portfolio

The credit card portfolio segment includes credit card loans originated and purchased by the Bank. Delinquency rates are the primary credit quality indicator for credit card loans as they provide an early warning that borrowers may be experiencing difficulties (30 days past due); information on those borrowers that have been delinquent for a longer period of time (90 days past due) is also considered. In addition to delinquency rates, the geographic distribution of the loans provides insight as to the credit quality of the portfolio based on the regional economy.

While the borrower's credit score is another general indicator of credit quality, the Bank does not view credit scores as a primary indicator of credit quality because the borrower's credit score tends to be a lagging indicator. The distribution of such scores provides a general indicator of credit quality trends within the portfolio; however, the score does not capture all factors that would be predictive of future credit performance. Refreshed FICO score information, which is obtained at least quarterly, for a statistically significant random sample of the credit card portfolio is indicated in the following table. FICO is considered to be the industry benchmark for credit scores.

The Bank generally originates new card accounts to prime consumer borrowers. However, certain cardholders' FICO scores may decrease over time, depending on the performance of the cardholder and changes in the credit score calculation.

The table below provides information about the Bank's credit card loans.

As of or for the year ended December 31, (in millions, except ratios)	2019	2018
Net charge-offs	\$ 4,848	\$ 4,518
Net charge-off rate	3.10%	3.10%
<b>Loan delinquency</b>		
Current and less than 30 days past due and still accruing	\$ 165,767	\$ 153,746
30-89 days past due and still accruing	1,550	1,426
90 or more days past due and still accruing	1,607	1,444
<b>Total retained credit card loans</b>	<b>\$ 168,924</b>	<b>\$ 156,616</b>
<b>Loan delinquency ratios</b>		
% of 30+ days past due to total retained loans	1.87%	1.83%
% of 90+ days past due to total retained loans	0.95	0.92
<b>Geographic region<sup>(a)</sup></b>		
California	\$ 25,783	\$ 23,757
Texas	16,728	15,085
New York	14,544	13,601
Florida	10,830	9,770
Illinois	9,579	8,938
New Jersey	7,165	6,739
Ohio	5,406	5,094
Pennsylvania	5,245	4,996
Colorado	4,763	4,309
Michigan	4,164	3,912
All other	64,717	60,415
<b>Total retained credit card loans</b>	<b>\$ 168,924</b>	<b>\$ 156,616</b>
<b>Percentage of portfolio based on carrying value with estimated refreshed FICO scores</b>		
Equal to or greater than 660	84.0%	84.2%
Less than 660	15.4	15.0
No FICO available	0.6	0.8

(a) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2019.

### Credit card impaired loans and loan modifications

The table below provides information about the Bank's impaired credit card loans. All of these loans are considered to be impaired as they have been modified in TDRs.

December 31, (in millions)	2019	2018
Impaired credit card loans with an allowance <sup>(a)(b)(c)</sup>	\$ 1,452	\$ 1,319
Allowance for loan losses related to impaired credit card loans	477	440

(a) The carrying value and the unpaid principal balance are the same for credit card impaired loans.

(b) There were no impaired loans without an allowance.

(c) Predominantly all impaired credit card loans are in the U.S.

The following table presents average balances of impaired credit card loans and interest income recognized on those loans.

Year ended December 31, (in millions)	2019	2018	2017
Average impaired credit card loans	\$ 1,389	\$ 1,260	\$ 1,214
Interest income on impaired credit card loans	72	65	59

### Loan modifications

The Bank may offer one of a number of loan modification programs to credit card borrowers who are experiencing financial difficulty. Most of the credit card loans have been modified under long-term programs for borrowers who are experiencing financial difficulties. These modifications involve placing the customer on a fixed payment plan, generally for 60 months, and typically include reducing the interest rate on the credit card. Substantially all modifications are considered to be TDRs.

If the cardholder does not comply with the modified payment terms, then the credit card loan continues to age and will ultimately be charged-off in accordance with the Bank's standard charge-off policy. In most cases, the Bank does not reinstate the borrower's line of credit.

New enrollments in these loan modification programs for the years ended December 31, 2019, 2018 and 2017, were \$961 million, \$866 million and \$756 million, respectively. For all periods disclosed, new enrollments were less than 1% of total retained credit card loans.

### Financial effects of modifications and redefaults

The following table provides information about the financial effects of the concessions granted on credit card loans modified in TDRs and redefaults for the periods presented.

Year ended December 31, (in millions, except weighted-average data)	2019	2018	2017
Weighted-average interest rate of loans - before TDR	19.07%	17.98%	16.58%
Weighted-average interest rate of loans - after TDR	4.70	5.16	4.88
Loans that redefaulted within one year of modification <sup>(a)</sup>	\$ 148	\$ 116	\$ 93

(a) Represents loans modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The amounts presented represent the balance of such loans as of the end of the interim period in which they defaulted.

For credit card loans modified in TDRs, payment default is deemed to have occurred when the borrower misses two consecutive contractual payments. A substantial portion of these loans are expected to be charged-off in accordance with the Bank's standard charge-off policy. Based on historical experience, the estimated weighted-average default rate for modified credit card loans was expected to be 32.89%, 33.38% and 31.54% as of December 31, 2019, 2018 and 2017, respectively.

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### Wholesale loan portfolio

Wholesale loans include loans made to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals.

The primary credit quality indicator for wholesale loans is the internal risk rating assigned to each loan. Risk ratings are used to identify the credit quality of loans and differentiate risk within the portfolio. Risk ratings on loans consider the probability of default (“PD”) and the loss given default (“LGD”). The PD is the likelihood that a loan will default. The LGD is the estimated loss on the loan that would be realized upon the default of the borrower and takes into consideration collateral and structural support for each credit facility.

Management considers several factors to determine an appropriate internal risk rating, including the obligor’s debt capacity and financial flexibility, the level of the obligor’s earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. The Bank’s internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody’s, however the quantitative characteristics (e.g., PDs and LGDs) may differ as they reflect internal historical experiences and assumptions. The Bank considers internal ratings equivalent to BBB-/Baa3 or higher as investment grade, and these ratings have a lower PD and/or lower LGD than non-investment grade ratings.

Noninvestment-grade ratings are further classified as noncriticized and criticized, and the criticized portion is further subdivided into performing and nonaccrual loans, representing management’s assessment of the collectibility of principal and interest. Criticized loans have a higher PD than noncriticized loans. The Bank’s definition of criticized aligns with the U.S. banking regulatory definition of criticized exposures, which consist of special mention, substandard and doubtful categories.

Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information affecting the obligor’s ability to fulfill its obligations.

As noted above, the risk rating of a loan considers the industry in which the obligor conducts its operations. As part of the overall credit risk management framework, the Bank focuses on the management and diversification of its industry and client exposures, with particular attention paid to industries with actual or potential credit concern. Refer to Note 5 for further detail on industry concentrations.

The table below provides information by class of receivable for the retained loans in the Wholesale portfolio segment. Refer to Note 5 for additional information on industry concentrations.

As of or for the year ended December 31, (in millions, except ratios)	Commercial and industrial		Real estate		Financial institutions		Governments & Agencies		Other <sup>(d)</sup>		Total retained loans	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
<b>Loans by risk ratings</b>												
Investment-grade	\$ 60,374	\$ 72,959	\$ 101,354	\$ 100,107	\$ 40,063	\$ 32,128	\$ 12,174	\$ 13,434	\$ 129,208	\$ 119,945	\$ 343,173	\$ 338,573
Noninvestment-grade:												
Noncriticized	51,324	51,592	13,841	14,876	15,718	15,196	108	178	12,142	11,515	93,133	93,357
Criticized performing	4,071	3,738	1,001	620	570	147	–	2	449	182	6,091	4,689
Criticized nonaccrual	752	851	48	134	3	4	–	–	40	161	843	1,150
<b>Total noninvestment-grade</b>	<b>56,147</b>	<b>56,181</b>	<b>14,890</b>	<b>15,630</b>	<b>16,291</b>	<b>15,347</b>	<b>108</b>	<b>180</b>	<b>12,631</b>	<b>11,858</b>	<b>100,067</b>	<b>99,196</b>
<b>Total retained loans</b>	<b>\$ 116,521</b>	<b>\$ 129,140</b>	<b>\$ 116,244</b>	<b>\$ 115,737</b>	<b>\$ 56,354</b>	<b>\$ 47,475</b>	<b>\$ 12,282</b>	<b>\$ 13,614</b>	<b>\$ 141,839</b>	<b>\$ 131,803</b>	<b>\$ 443,240</b>	<b>\$ 437,769</b>
% of total criticized to total retained loans	4.14%	3.55%	0.90%	0.65 %	1.02%	0.32%	–%	0.01%	0.34%	0.26%	1.56%	1.33%
% of criticized nonaccrual to total retained loans	0.65	0.66	0.04	0.12	0.01	0.01	–	–	0.03	0.12	0.19	0.26
<b>Loans by geographic distribution<sup>(a)</sup></b>												
Total non-U.S.	\$ 28,253	\$ 29,572	\$ 4,123	\$ 2,967	\$ 16,795	\$ 18,521	\$ 2,232	\$ 3,150	\$ 49,960	\$ 48,431	\$ 101,363	\$ 102,641
Total U.S.	88,268	99,568	112,121	112,770	39,559	28,954	10,050	10,464	91,879	83,372	341,877	335,128
<b>Total retained loans</b>	<b>\$ 116,521</b>	<b>\$ 129,140</b>	<b>\$ 116,244</b>	<b>\$ 115,737</b>	<b>\$ 56,354</b>	<b>\$ 47,475</b>	<b>\$ 12,282</b>	<b>\$ 13,614</b>	<b>\$ 141,839</b>	<b>\$ 131,803</b>	<b>\$ 443,240</b>	<b>\$ 437,769</b>
Net charge-offs/ (recoveries)	\$ 329	\$ 126	\$ 12	\$ (20)	\$ –	\$ –	\$ –	\$ –	\$ 28	\$ 10	\$ 369	\$ 116
% of net charge-offs/ (recoveries) to end-of-period retained loans	0.28%	0.10%	0.01%	(0.02)%	–%	–%	–%	–%	0.02%	0.01%	0.08%	0.03%
<b>Loan delinquency<sup>(b)</sup></b>												
Current and less than 30 days past due and still accruing	\$ 115,395	\$ 128,012	\$ 116,098	\$ 115,533	\$ 56,329	\$ 47,449	\$ 12,253	\$ 13,593	\$ 141,412	\$ 130,936	\$ 441,487	\$ 435,523
30–89 days past due and still accruing	339	109	94	67	20	12	28	17	387	703	868	908
90 or more days past due and still accruing <sup>(c)</sup>	35	168	4	3	2	10	1	4	–	3	42	188
Criticized nonaccrual	752	851	48	134	3	4	–	–	40	161	843	1,150
<b>Total retained loans</b>	<b>\$ 116,521</b>	<b>\$ 129,140</b>	<b>\$ 116,244</b>	<b>\$ 115,737</b>	<b>\$ 56,354</b>	<b>\$ 47,475</b>	<b>\$ 12,282</b>	<b>\$ 13,614</b>	<b>\$ 141,839</b>	<b>\$ 131,803</b>	<b>\$ 443,240</b>	<b>\$ 437,769</b>

(a) The U.S. and non-U.S. distribution is determined based predominantly on the domicile of the borrower.

(b) The credit quality of wholesale loans is assessed primarily through ongoing review and monitoring of an obligor's ability to meet contractual obligations rather than relying on the past due status, which is generally a lagging indicator of credit quality.

(c) Represents loans that are considered well-collateralized and therefore still accruing interest.

(d) Other includes individuals and individual entities (predominantly consists of wealth management clients and includes loans to personal investment companies and personal and testamentary trusts), SPEs and Private education and civic organizations. Refer to Note 15 for more information on SPEs.

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The following table presents additional information on the real estate class of loans within the Wholesale portfolio for the periods indicated, which consists primarily of secured commercial loans, of which multifamily is the largest segment. Multifamily lending finances acquisition, leasing and construction of apartment buildings, and includes loans to real estate investment trusts (“REITs”). Other commercial lending largely includes financing for acquisition, leasing and construction, largely for office, retail and industrial real estate, and includes loans to REITs. Included in real estate loans is \$8.2 billion and \$10.5 billion as of December 31, 2019 and 2018, respectively, of construction and development loans originally purposed for construction and development, general purpose loans for builders, as well as loans for land subdivision and pre-development.

December 31, (in millions, except ratios)	Multifamily		Other Commercial		Total real estate loans	
	2019	2018	2019	2018	2019	2018
Real estate retained loans	\$ 79,402	\$ 79,184	\$ 36,842	\$ 36,553	\$ 116,244	\$ 115,737
Criticized	407	388	642	366	1,049	754
% of total criticized to total real estate retained loans	0.51%	0.49%	1.74%	1.00%	0.90%	0.65%
Criticized nonaccrual	\$ 38	\$ 57	\$ 10	\$ 77	\$ 48	\$ 134
% of criticized nonaccrual loans to total real estate retained loans	0.05%	0.07%	0.03%	0.21%	0.04%	0.12%

### Wholesale impaired retained loans and loan modifications

Wholesale impaired retained loans consist of loans that have been placed on nonaccrual status and/or that have been modified in a TDR. All impaired loans are evaluated for an asset-specific allowance as described in Note 14.

The table below sets forth information about the Bank’s wholesale impaired retained loans.

December 31, (in millions)	Commercial and industrial		Real estate		Financial institutions		Other		Total retained loans	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
<b>Impaired loans</b>										
With an allowance	\$ 637	\$ 807	\$ 49	\$ 107	\$ 3	\$ 4	\$ 42	\$ 152	\$ 731	\$ 1,070
Without an allowance <sup>(a)</sup>	177	140	—	27	—	—	4	13	181	180
<b>Total impaired loans</b>	<b>\$ 814</b>	<b>\$ 947</b>	<b>\$ 49</b>	<b>\$ 134</b>	<b>\$ 3</b>	<b>\$ 4</b>	<b>\$ 46</b>	<b>\$ 165</b>	<b>\$ 912</b> <sup>(c)</sup>	<b>\$ 1,250</b> <sup>(c)</sup>
Allowance for loan losses related to impaired loans	\$ 221	\$ 252	\$ 9	\$ 25	\$ 1	\$ 1	\$ 3	\$ 19	\$ 234	\$ 297
Unpaid principal balance of impaired loans <sup>(b)</sup>	974	1,043	72	203	4	4	54	473	1,104	1,723

(a) When the discounted cash flows, collateral value or market price equals or exceeds the recorded investment in the loan, the loan does not require an allowance. This typically occurs when the impaired loans have been partially charged-off and/or there have been interest payments received and applied to the loan balance.

(b) Represents the contractual amount of principal owed at December 31, 2019 and 2018. The unpaid principal balance differs from the impaired loan balances due to various factors, including charge-offs; interest payments received and applied to the carrying value; net deferred loan fees or costs; and unamortized discount or premiums on purchased loans.

(c) Based upon the domicile of the borrower, largely consists of loans in the U.S.

The following table presents the Bank’s average impaired retained loans for the years ended 2019, 2018 and 2017.

Year ended December 31, (in millions)	2019	2018	2017
Commercial and industrial	\$ 1,086	\$ 1,027	\$ 1,256
Real estate	94	133	165
Financial institutions	11	57	48
Other	168	199	241
<b>Total<sup>(a)</sup></b>	<b>\$ 1,359</b>	<b>\$ 1,416</b>	<b>\$ 1,710</b>

(a) The related interest income on accruing impaired loans and interest income recognized on a cash basis were not material for the years ended December 31, 2019, 2018 and 2017.

Certain loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. All TDRs are reported as impaired loans in the tables above. TDRs were \$460 million and \$576 million as of December 31, 2019 and 2018, respectively. The impact of these modifications, as well as new TDRs, were not material to the Bank for the years ended December 31, 2019, 2018 and 2017.

## Note 14 – Allowance for credit losses

The Bank's allowance for loan losses represents management's estimate of probable credit losses inherent in the the Bank's retained loan portfolio, which consists of the two consumer portfolio segments (primarily scored) and the wholesale portfolio segment (risk-rated). The allowance for loan losses includes a formula-based component, an asset-specific component, and a component related to PCI loans, as described below. Management also estimates an allowance for wholesale and certain consumer lending-related commitments using methodologies similar to those used to estimate the allowance on the underlying loans.

The Bank's policies used to determine its allowance for credit losses are described in the following paragraphs.

Determining the appropriateness of the allowance is complex and requires judgment by management about the effect of matters that are inherently uncertain. Subsequent evaluations of the loan portfolio, in light of the factors then prevailing, may result in significant changes in the allowances for loan losses and lending-related commitments in future periods. At least quarterly, the allowance for credit losses is reviewed by the CRO, the Chief Financial Officer ("CFO") and the Controller of JPMorgan Chase. As of December 31, 2019, the Bank deemed the allowance for credit losses to be appropriate and sufficient to absorb probable credit losses inherent in the portfolio.

### Formula-based component

The formula-based component is based on a statistical calculation to provide for incurred credit losses in all consumer loans and performing risk-rated loans. All loans restructured in TDRs as well as any impaired risk-rated loans have an allowance assessed as part of the asset-specific component, while PCI loans have an allowance assessed as part of the PCI component. Refer to Note 13 for more information on TDRs, Impaired loans and PCI loans.

#### *Formula-based component - Consumer loans and certain lending-related commitments*

The formula-based allowance for credit losses for the consumer portfolio segments is calculated by applying statistical credit loss factors (estimated PD and loss severities) to the recorded investment balances or loan-equivalent amounts of pools of loan exposures with similar risk characteristics over a loss emergence period to arrive at an estimate of incurred credit losses. Estimated loss emergence periods may vary by product and may change over time; management applies judgment in estimating loss emergence periods, using available credit information and trends. In addition, management applies judgment to the statistical loss estimates for each loan portfolio category, using delinquency trends and other risk characteristics to estimate the total incurred credit losses in the portfolio. Management uses additional statistical methods and considers actual portfolio performance, including actual

losses recognized on defaulted loans and collateral valuation trends, to review the appropriateness of the primary statistical loss estimate. The economic impact of potential modifications of residential real estate loans is not included in the statistical calculation because of the uncertainty regarding the type and results of such modifications.

The statistical calculation is then adjusted to take into consideration model imprecision, external factors and current economic events that have occurred but that are not yet reflected in the factors used to derive the statistical calculation; these adjustments are accomplished in part by analyzing the historical loss experience for each major product segment. However, it is difficult to predict whether historical loss experience is indicative of future loss levels. Management applies judgment in making this adjustment, taking into account uncertainties associated with current macroeconomic and political conditions, quality of underwriting standards, borrower behavior, and other relevant internal and external factors affecting the credit quality of the portfolio. In certain instances, the interrelationships between these factors create further uncertainties. The application of different inputs into the statistical calculation, and the assumptions used by management to adjust the statistical calculation, are subject to management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for credit losses for the consumer credit portfolio.

Overall, the allowance for credit losses for consumer portfolios is sensitive to changes in the economic environment (e.g., unemployment rates), delinquency rates, the realizable value of collateral (e.g., housing prices), FICO scores, borrower behavior and other risk factors. While all of these factors are important determinants of overall allowance levels, changes in the various factors may not occur at the same time or at the same rate, or changes may be directionally inconsistent such that improvement in one factor may offset deterioration in another. In addition, changes in these factors would not necessarily be consistent across all geographies or product types. Finally, it is difficult to predict the extent to which changes in these factors would ultimately affect the frequency of losses, the severity of losses or both.

#### *Formula-based component - Wholesale loans and lending-related commitments*

The Bank's methodology for determining the allowance for loan losses and the allowance for lending-related commitments involves the early identification of credits that are deteriorating. The formula-based component of the allowance for wholesale loans and lending-related commitments is calculated by applying statistical credit loss factors (estimated PD and LGD) to the recorded investment balances or loan-equivalent over a loss emergence period to

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arrive at an estimate of incurred credit losses in the portfolio. Estimated loss emergence periods may vary by the funded versus unfunded status of the instrument and may change over time.

The Bank assesses the credit quality of a borrower or counterparty and assigns an internal risk rating. Risk ratings are assigned at origination or acquisition, and if necessary, adjusted for changes in credit quality over the life of the exposure. In assessing the risk rating of a particular loan or lending-related commitment, among the factors considered are the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. These factors are based on an evaluation of historical and current information and involve subjective assessment and interpretation. Determining risk ratings involves significant judgment; emphasizing one factor over another or considering additional factors could affect the risk rating assigned by the Bank.

A PD estimate is determined based on the the Bank's history of defaults over more than one credit cycle.

LGD estimate is a judgment-based estimate assigned to each loan or lending-related commitment. The estimate represents the amount of economic loss if the obligor were to default. The type of obligor, quality of collateral, and the seniority of the Bank's lending exposure in the obligor's capital structure affect LGD.

The Bank applies judgment in estimating PD, LGD, loss emergence period and loan-equivalent used in calculating the allowance for credit losses. Estimates of PD, LGD, loss emergence period and loan-equivalent used are subject to periodic refinement based on any changes to underlying external or Bank-specific historical data. Changes to the time period used for PD and LGD estimates could also affect the allowance for credit losses. The use of different inputs, estimates or methodologies could change the amount of the allowance for credit losses determined appropriate by the Bank.

In addition to the statistical credit loss estimates applied to the wholesale portfolio, management applies its judgment to adjust the statistical estimates for wholesale loans and lending-related commitments, taking into consideration model imprecision, external factors and economic events that have occurred but are not yet reflected in the loss factors. Historical experience of both LGD and PD are considered when estimating these adjustments. Factors related to concentrated and deteriorating industries also are incorporated where relevant. These estimates are based on management's view of uncertainties that relate to current macroeconomic conditions, quality of underwriting standards and other relevant internal and external factors affecting the credit quality of the current portfolio.

### Asset-specific component

The asset-specific component of the allowance relates to loans considered to be impaired, which includes loans that have been modified in TDRs as well as risk-rated loans that have been placed on nonaccrual status. To determine the asset-specific component of the allowance, larger risk-rated loans (primarily loans in the wholesale portfolio segment) are evaluated individually, while smaller loans (both risk-rated and scored) are evaluated as pools using historical loss experience for the respective class of assets.

The Bank generally measures the asset-specific allowance as the difference between the recorded investment in the loan and the present value of the cash flows expected to be collected, discounted at the loan's original effective interest rate. Subsequent changes in impairment are reported as an adjustment to the allowance for loan losses. In certain cases, the asset-specific allowance is determined using an observable market price, and the allowance is measured as the difference between the recorded investment in the loan and the loan's fair value. Collateral-dependent loans are charged down to the fair value of collateral less costs to sell. For any of these impaired loans, the amount of the asset-specific allowance required to be recorded, if any, is dependent upon the recorded investment in the loan (including prior charge-offs), and either the expected cash flows or fair value of collateral. Refer to Note 13 for more information about charge-offs and collateral-dependent loans.

The asset-specific component of the allowance for impaired loans that have been modified in TDRs (including forgone interest, principal forgiveness, as well as other concessions) incorporates the effect of the modification on the loan's expected cash flows, which considers the potential for redefault. For residential real estate loans modified in TDRs, the Bank develops product-specific probability of default estimates, which are applied at a loan level to compute expected losses. In developing these probabilities of default, the Bank considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about home prices and unemployment, based upon industry-wide data. The Bank also considers its own historical loss experience to-date based on actual redefaulted modified loans. For credit card loans modified in TDRs, expected losses incorporate projected redefaults based on the Bank's historical experience by type of modification program. For wholesale loans modified in TDRs, expected losses incorporate management's expectation of the borrower's ability to repay under the modified terms.

Estimating the timing and amounts of future cash flows is highly judgmental as these cash flow projections rely upon estimates such as loss severities, asset valuations, default rates (including redefault rates on modified loans), the amounts and timing of interest or principal payments (including any expected prepayments) or other factors that

are reflective of current and expected market conditions. These estimates are, in turn, dependent on factors such as the duration of current overall economic conditions, industry-, portfolio-, or borrower-specific factors, the expected outcome of insolvency proceedings as well as, in certain circumstances, other economic factors, including the level of future home prices. All of these estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

#### **PCI loans**

In connection with the acquisition of certain PCI loans, which are accounted for as described in Note 13, the allowance for loan losses for the PCI portfolio is based on quarterly estimates of the amount of principal and interest cash flows expected to be collected over the estimated remaining lives of the loans.

These cash flow projections are based on estimates regarding default rates (including redefault rates on modified loans), loss severities, the amounts and timing of prepayments and other factors that are reflective of current and expected future market conditions. These estimates are dependent on assumptions regarding the level of future home prices, and the duration of current overall economic conditions, among other factors. These estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

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### Allowance for credit losses and related information

The table below summarizes information about the allowances for loan losses and lending-relating commitments, and includes a breakdown of loans and lending-related commitments by impairment methodology.

(Table continued on next page)

Year ended December 31, (in millions)	2019			
	Consumer, excluding credit card	Credit card	Wholesale	Total
<b>Allowance for loan losses</b>				
Beginning balance at January 1,	\$ 4,145	\$ 5,184	\$ 4,096	\$ 13,425
Gross charge-offs	963	5,436	411	6,810
Gross recoveries	(551)	(588)	(42)	(1,181)
<b>Net charge-offs</b>	<b>412</b>	<b>4,848</b>	<b>369</b>	<b>5,629</b>
Write-offs of PCI loans <sup>(a)</sup>	151	—	—	151
Provision for loan losses	(383)	5,348	492	5,457
Other	(1)	(1)	6	4
<b>Ending balance at December 31,</b>	<b>\$ 3,198</b>	<b>\$ 5,683</b>	<b>\$ 4,225</b>	<b>\$ 13,106</b>
<b>Allowance for loan losses by impairment methodology</b>				
Asset-specific <sup>(b)</sup>	\$ 136	\$ 477 <sup>(c)</sup>	\$ 234	\$ 847
Formula-based	2,075	5,206	3,991	11,272
PCI	987	—	—	987
<b>Total allowance for loan losses</b>	<b>\$ 3,198</b>	<b>\$ 5,683</b>	<b>\$ 4,225</b>	<b>\$ 13,106</b>
<b>Loans by impairment methodology</b>				
Asset-specific	\$ 6,166	\$ 1,452	\$ 912	\$ 8,530
Formula-based	305,366	167,472	442,328	915,166
PCI	20,363	—	—	20,363
<b>Total retained loans</b>	<b>\$ 331,895</b>	<b>\$ 168,924</b>	<b>\$ 443,240</b>	<b>\$ 944,059</b>
<b>Impaired collateral-dependent loans</b>				
Net charge-offs	\$ 57	\$ —	\$ 25	\$ 82
Loans measured at fair value of collateral less cost to sell	2,057	—	81	2,138
<b>Allowance for lending-related commitments</b>				
Beginning balance at January 1,	\$ 33	\$ —	\$ 1,021	\$ 1,054
Provision for lending-related commitments	—	—	136	136
Other	—	—	—	—
<b>Ending balance at December 31,</b>	<b>\$ 33</b>	<b>\$ —</b>	<b>\$ 1,157</b>	<b>\$ 1,190</b>
<b>Allowance for lending-related commitments by impairment methodology</b>				
Asset-specific	\$ —	\$ —	\$ 102	\$ 102
Formula-based	33	—	1,055	1,088
<b>Total allowance for lending-related commitments</b>	<b>\$ 33</b>	<b>\$ —</b>	<b>\$ 1,157</b>	<b>\$ 1,190</b>
<b>Lending-related commitments by impairment methodology</b>				
Asset-specific	\$ —	\$ —	\$ 474	\$ 474
Formula-based	51,412	650,720	402,113	1,104,245
<b>Total lending-related commitments</b>	<b>\$ 51,412</b>	<b>\$ 650,720</b>	<b>\$ 402,587</b>	<b>\$ 1,104,719</b>

(a) Write-offs of PCI loans are recorded against the allowance for loan losses when actual losses for a pool exceed estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan is recognized when the underlying loan is removed from a pool.

(b) Includes risk-rated loans that have been placed on nonaccrual status and loans that have been modified in a TDR.

(c) The asset-specific credit card allowance for loan losses is related to loans that have been modified in a TDR; such allowance is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.

(table continued from previous page)

2018				2017			
Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
\$ 4,577	\$ 4,884	\$ 4,083	\$ 13,544	\$ 5,195	\$ 4,034	\$ 4,478	\$ 13,707
1,025	5,011	274	6,310	1,779	4,521	212	6,512
(842)	(493)	(158)	(1,493)	(634)	(398)	(93)	(1,125)
183	4,518	116	4,817	1,145	4,123	119	5,387
187	—	—	187	86	—	—	86
(63)	4,818	130	4,885	613	4,973	(278)	5,308
1	—	(1)	—	—	—	2	2
\$ 4,145	\$ 5,184	\$ 4,096	\$ 13,425	\$ 4,577	\$ 4,884	\$ 4,083	\$ 13,544
\$ 196	\$ 440 <sup>(c)</sup>	\$ 297	\$ 933	\$ 246	\$ 383 <sup>(c)</sup>	\$ 430	\$ 1,059
2,161	4,744	3,799	10,704	2,106	4,501	3,653	10,260
1,788	—	—	1,788	2,225	—	—	2,225
\$ 4,145	\$ 5,184	\$ 4,096	\$ 13,425	\$ 4,577	\$ 4,884	\$ 4,083	\$ 13,544
\$ 6,867	\$ 1,319	\$ 1,250	\$ 9,436	\$ 8,071	\$ 1,215	\$ 1,808	\$ 11,094
342,708	155,297	436,516	934,521	333,870	148,172	400,068	882,110
24,034	—	3	24,037	30,576	—	3	30,579
\$ 373,609	\$ 156,616	\$ 437,769	\$ 967,994	\$ 372,517	\$ 149,387	\$ 401,879	\$ 923,783
\$ 24	\$ —	\$ 21	\$ 45	\$ 65	\$ —	\$ 31	\$ 96
2,078	—	202	2,280	2,131	—	233	2,364
\$ 33	\$ —	\$ 1,035	\$ 1,068	\$ 26	\$ —	\$ 1,052	\$ 1,078
—	—	(13)	(13)	7	—	(17)	(10)
—	—	(1)	(1)	—	—	—	—
\$ 33	\$ —	\$ 1,021	\$ 1,054	\$ 33	\$ —	\$ 1,035	\$ 1,068
\$ —	\$ —	\$ 99	\$ 99	\$ —	\$ —	\$ 187	\$ 187
33	—	922	955	33	—	848	881
\$ 33	\$ —	\$ 1,021	\$ 1,054	\$ 33	\$ —	\$ 1,035	\$ 1,068
\$ —	\$ —	\$ 469	\$ 469	\$ —	\$ —	\$ 731	\$ 731
46,066	605,379	386,270	1,037,715	48,553	572,986	368,528	990,067
\$ 46,066	\$ 605,379	\$ 386,739	\$ 1,038,184	\$ 48,553	\$ 572,986	\$ 369,259	\$ 990,798

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### Note 15 – Variable interest entities

Refer to Note 1 for a further description of the Bank’s accounting policies regarding consolidation of VIEs.

The following table summarizes the most significant types of Bank-sponsored VIEs. The Bank considers a “sponsored” VIE to include any entity where: (1) The Bank is the primary beneficiary of the structure; (2) the VIE is used by the Bank to securitize Bank assets; (3) the VIE issues financial instruments with the JPMorgan Chase Bank, N.A. name; or (4) the entity is a JPMorgan Chase Bank, N.A.-administered asset-backed commercial paper conduit.

<i>Transaction Type</i>	<i>Activity</i>	<i>Consolidated Financial Statements page reference</i>
Credit card securitization trusts	Securitization of originated credit card receivables	94-95
Mortgage securitization trusts	Servicing and securitization of both originated and purchased residential mortgages	94-96
Mortgage and other securitization trusts	Securitization of both originated and purchased residential and commercial mortgages, and other consumer loans	94-96
Multi-seller conduits	Assist clients in accessing the financial markets in a cost-efficient manner and structures transactions to meet investor needs	96-97
Municipal bond vehicles	Financing of municipal bond investments	97

The Bank is also involved with VIEs (both third-party and Bank-sponsored), but to a lesser extent, as follows:

- The Bank provides financing and lending-related services to a wide spectrum of clients, including certain third-party-sponsored entities that may meet the definition of a VIE. The Bank does not control the activities of these entities and does not consolidate these entities. The Bank’s maximum loss exposure, regardless of whether the entity is a VIE, is generally limited to loans and lending-related commitments which are reported and disclosed in the same manner as any other third-party transaction.
- The Bank is involved with entities that may meet the definition of VIEs; however these entities are generally subject to specialized investment company accounting, which does not require the consolidation of investments, including VIEs.
- The Bank invests in securities generally issued by third parties which may meet the definition of VIEs (e.g., issuers of asset-backed securities). In general, the Bank does not have the power to direct the significant activities of these entities and therefore does not consolidate these entities. Refer to Note 11 for further information on the Bank’s investment securities portfolio.
- The Bank also invests in and provides financing and other services to VIEs sponsored by third parties. Refer to page 99 of this Note for more information on the VIEs sponsored by third parties.

#### Significant Bank-sponsored variable interest entities

##### ***Credit card securitizations***

The Bank may securitize originated credit card loans, primarily through the Chase Issuance Trust (the “Trust”). The Bank’s continuing involvement in credit card securitizations includes servicing the receivables, retaining an undivided seller’s interest in the receivables, retaining certain senior and subordinated securities and maintaining escrow accounts.

The Bank is considered to be the primary beneficiary of these Bank-sponsored credit card securitization trusts based on the Bank’s ability to direct the activities of these VIEs through its servicing responsibilities and other duties, including making decisions as to the receivables that are transferred into those trusts and as to any related modifications and workouts. Additionally, the nature and extent of the Bank’s other continuing involvement with the trusts, as indicated above, obligates the Bank to absorb losses and gives the Bank the right to receive certain

benefits from these VIEs that could potentially be significant.

The underlying securitized credit card receivables and other assets of the securitization trusts are available only for payment of the beneficial interests issued by the securitization trusts; they are not available to pay the Bank’s other obligations or the claims of the Bank’s creditors.

The agreements with the credit card securitization trusts require the Bank to maintain a minimum undivided interest in the credit card trusts (generally 5%). As of December 31, 2019 and 2018, the Bank held undivided interests in Bank-sponsored credit card securitization trusts of \$5.3 billion and \$15.1 billion, respectively. The Bank maintained an average undivided interest in principal receivables owned by those trusts of approximately 50% and 37% for the years ended December 31, 2019 and 2018. The Bank did not retain any senior securities and retained \$3.0 billion of subordinated securities in certain of its credit card securitization trusts as of both December 31, 2019 and

2018, respectively. The Bank's undivided interests in the credit card trusts and securities retained are eliminated in consolidation.

**Bank-sponsored mortgage and other securitization trusts**  
The Bank securitizes (or has securitized) originated and purchased residential mortgages, commercial mortgages and other consumer loans. Depending on the particular transaction, as well as the respective business involved, the Bank may act as the servicer of the loans and/or retain certain beneficial interests in the securitization trusts.

The following table presents the total unpaid principal amount of assets held in Bank-sponsored private-label securitization entities, including those in which the Bank has continuing involvement, and those that are consolidated by the Bank. Continuing involvement includes servicing the loans, holding senior interests or subordinated interests (including amounts required to be held pursuant to credit risk retention rules), recourse or guarantee arrangements, and derivative contracts. In certain instances, the Bank's only continuing involvement is servicing the loans. The Bank's maximum loss exposure from retained and purchased interests is the carrying value of these interests. Refer to Securitization activity on page 100 of this Note for further information regarding the Bank's cash flows associated with and interests retained in nonconsolidated VIEs, and pages 100-101 of this Note for information on the Bank's loan sales and securitization activity related to U.S. GSEs and government agencies.

December 31, 2019 (in millions)	Principal amount outstanding			The Bank interest in securitized assets in nonconsolidated VIEs <sup>(c)(d)</sup>			
	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by the Bank
<b>Securitization-related<sup>(a)</sup></b>							
Residential mortgage:							
Prime/Alt-A and option ARMs	\$ 46,844	\$ 2,759	\$ 37,602	\$ 316	\$ 608	\$ –	\$ 924
Subprime	9,974	–	9,338	–	–	–	–
Commercial and other <sup>(b)</sup>	110,596	–	31,453	159	772	241	1,172
<b>Total</b>	<b>\$ 167,414</b>	<b>\$ 2,759</b>	<b>\$ 78,393</b>	<b>\$ 475</b>	<b>\$ 1,380</b>	<b>\$ 241</b>	<b>\$ 2,096</b>

December 31, 2018 (in millions)	Principal amount outstanding			The Bank interest in securitized assets in nonconsolidated VIEs <sup>(c)(d)</sup>			
	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by the Bank
<b>Securitization-related<sup>(a)</sup></b>							
Residential mortgage:							
Prime/Alt-A and option ARMs	\$ 47,051	\$ 3,237	\$ 36,731	\$ 222	\$ 613	\$ –	\$ 835
Subprime	11,260	–	10,605	–	–	–	–
Commercial and other <sup>(b)</sup>	100,905	–	24,580	244	772	210	1,226
<b>Total</b>	<b>\$ 159,216</b>	<b>\$ 3,237</b>	<b>\$ 71,916</b>	<b>\$ 466</b>	<b>\$ 1,385</b>	<b>\$ 210</b>	<b>\$ 2,061</b>

(a) Excludes U.S. GSEs and government agency securitizations, which are not Bank-sponsored. Refer to pages 100-101 of this Note for information on the Bank's loan sales and securitization activity related to U.S. GSEs and government agencies.

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

(c) Excludes the following: retained servicing (refer to Note 16 for a discussion of MSRs); securities retained from loan sales and securitization activity related to U.S. GSEs and government agencies; interest rate and foreign exchange derivatives primarily used to manage interest rate and foreign exchange risks of securitization entities (refer to Note 6 for further information on derivatives). There were no senior and subordinated securities purchased in connection with the Bank's secondary market-making activities at December 31, 2019 and 2018, respectively.

(d) As of December 31, 2019 and 2018, 63% and 48%, respectively, of the Bank's retained securitization interests, which are predominantly carried at fair value and include amounts required to be held pursuant to credit risk retention rules, were risk-rated "A" or better, on an S&P-equivalent basis. The retained interests in prime residential mortgages consisted of \$894 million and \$826 million of investment-grade and \$30 million and \$9 million of noninvestment-grade at December 31, 2019 and 2018, respectively. The retained interests in commercial and other securitizations trusts consisted of \$803 million and \$777 million of investment-grade and \$369 million and \$448 million of noninvestment-grade retained interests at December 31, 2019 and 2018, respectively.

## Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
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### *Residential mortgage*

The Bank securitizes originated residential mortgage loans, as well as residential mortgage loans purchased from third parties. The Bank generally retains servicing for all residential mortgage loans originated and may retain servicing for certain mortgage loans purchased. For securitizations of loans serviced by the Bank, it has the power to direct the significant activities of the VIE because it is responsible for decisions related to loan modifications and workouts. The Bank may also retain an interest upon securitization.

In addition, the Bank may engage in trading activities involving securities issued by Bank-sponsored securitization trusts. As a result, the Bank at times retains senior and/or subordinated interests (including residual interests and amounts required to be held pursuant to credit risk retention rules) in residential mortgage securitizations at the time of securitization, and/or reacquires positions in the secondary market in the normal course of business. In certain instances, as a result of the positions retained or reacquired by the Bank, when considered together with the servicing arrangements entered into, the Bank, is deemed to be the primary beneficiary of certain securitization trusts. Refer to the table on page 98 of this Note for more information on consolidated residential mortgage securitizations.

The Bank does not consolidate residential mortgage securitizations (Bank-sponsored or third-party-sponsored) when it is not the servicer (and therefore does not have the power to direct the most significant activities of the trust) or does not hold a beneficial interest in the trust that could potentially be significant to the trust. Refer to the table on page 98 of this Note for more information on the consolidated residential mortgage securitizations, and the table on the previous page of this Note for further information on interests held in nonconsolidated residential mortgage securitizations.

### *Commercial mortgages and other consumer securitizations*

The Bank originates and securitizes commercial mortgage loans, and engages in underwriting and trading activities involving the securities issued by securitization trusts. The Bank may retain unsold senior and/or subordinated interests (including amounts required to be held pursuant to credit risk retention rules) in commercial mortgage securitizations at the time of securitization but, generally, the Bank does not service commercial loan securitizations. For commercial mortgage securitizations the power to direct the significant activities of the VIE generally is held by the servicer or investors in a specified class of securities (“controlling class”). The Bank generally does not retain an interest in the controlling class in its sponsored commercial mortgage securitization transactions. Refer to the table on page 98 of this Note for more information on the consolidated commercial mortgage securitizations, and the table on the previous page of this Note for further information on interests held in nonconsolidated securitizations.

### **Multi-seller conduits**

Multi-seller conduit entities are separate bankruptcy remote entities that provide secured financing, collateralized by pools of receivables and other financial assets, to customers of the Bank. The conduits fund their financing facilities through the issuance of highly rated commercial paper. The primary source of repayment of the commercial paper is the cash flows from the pools of assets. In most instances, the assets are structured with deal-specific credit enhancements provided to the conduits by the customers (i.e., sellers) or other third parties. Deal-specific credit enhancements are generally structured to cover a multiple of historical losses expected on the pool of assets, and are typically in the form of overcollateralization provided by the seller. The deal-specific credit enhancements mitigate the Bank’s potential losses on its agreements with the conduits.

To ensure timely repayment of the commercial paper, and to provide the conduits with funding to provide financing to customers in the event that the conduits do not obtain funding in the commercial paper market, each asset pool financed by the conduits has a minimum 100% deal-specific liquidity facility associated with it provided by the Bank. The Bank also provides the multi-seller conduit vehicles with uncommitted program-wide liquidity facilities and program-wide credit enhancement in the form of standby letters of credit. The amount of program-wide credit enhancement required is based upon commercial paper issuance and approximates 10% of the outstanding balance of commercial paper.

The Bank consolidates its Bank-administered multi-seller conduits, as it has both the power to direct the significant activities of the conduits and a potentially significant economic interest in the conduits. As administrative agent and in its role in structuring transactions, the Bank makes decisions regarding asset types and credit quality, and manages the commercial paper funding needs of the conduits. The Bank's interests that could potentially be significant to the VIEs include the fees received as administrative agent and liquidity and program-wide credit enhancement provider, as well as the potential exposure created by the liquidity and credit enhancement facilities provided to the conduits. Refer to page 98 of this Note for further information on consolidated VIE assets and liabilities.

In the normal course of business, the Bank makes markets in and invests in commercial paper issued by Bank-administered multi-seller conduits. The Bank held \$16.3 billion and \$20.1 billion of the commercial paper issued by Bank-administered multi-seller conduits at December 31, 2019 and 2018, respectively, which have been eliminated in consolidation. The Bank's investments reflect its funding needs and capacity and were not driven by market illiquidity. Other than the amounts required to be held pursuant to credit risk retention rules, the Bank is not obligated under any agreement to purchase the commercial paper issued by Bank-administered multi-seller conduits.

The Bank provides deal-specific liquidity as well as program-wide liquidity and credit enhancement to its administered multi-seller conduits, which have been eliminated in consolidation. The administered multi-seller conduits then provide certain of their clients with lending-related commitments. The unfunded commitments were \$8.9 billion and \$8.0 billion at December 31, 2019 and 2018, respectively, and are reported as off-balance sheet lending-related commitments in other unfunded commitments to extend credit. Refer to Note 26 for more information on off-balance sheet lending-related commitments.

### ***Municipal bond vehicles***

Municipal bond vehicles or tender option bond ("TOB") trusts allow institutions to finance their municipal bond investments at short-term rates. In a typical TOB transaction, the trust purchases highly rated municipal bond(s) of a single issuer and funds the purchase by issuing two types of securities: (1) puttable floating-rate certificates ("floaters") and (2) inverse floating-rate residual interests ("residuals"). The floaters are typically purchased by money market funds or other short-term investors and may be tendered, with requisite notice, to the TOB trust. The residuals are retained by the investor seeking to finance its municipal bond investment. TOB transactions where the residual is held by a third-party investor are typically known as customer TOB trusts, and non-customer TOB trusts are transactions where the Residual is retained by the Bank. Customer TOB trusts are sponsored by a third party; refer to page 99 of this Note for further information. The Bank serves as sponsor for all non-customer TOB transactions. The Bank may provide various services to a TOB trust, including liquidity or tender option provider, and/or sponsor.

The Bank often serves as the sole liquidity or tender option provider for the TOB trusts. The liquidity provider's obligation to perform is conditional and is limited by certain events ("Termination Events"), which include bankruptcy or failure to pay by the municipal bond issuer or credit enhancement provider, an event of taxability on the municipal bonds or the immediate downgrade of the municipal bond to below investment grade. In addition, the liquidity provider's exposure is typically further limited by the high credit quality of the underlying municipal bonds, the excess collateralization in the vehicle, or, in certain transactions, the reimbursement agreements with the Residual holders.

Holders of the floaters may "put," or tender, their floaters to the TOB trust. If the remarketing agent cannot successfully remarket the floaters to another investor, the liquidity provider either provides a loan to the TOB trust for the TOB trust's purchase of the floaters, or it directly purchases the tendered floaters.

TOB trusts are considered to be variable interest entities. The Bank consolidates non-customer TOB trusts because as the Residual holder, the Bank has the right to make decisions that significantly impact the economic performance of the municipal bond vehicle, and it has the right to receive benefits and bear losses that could potentially be significant to the municipal bond vehicle.

## Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
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### Consolidated VIE assets and liabilities

The following table presents information on assets and liabilities related to VIEs consolidated by the Bank as of December 31, 2019 and 2018.

December 31, 2019 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other <sup>(b)</sup>	Total assets <sup>(c)</sup>	Beneficial interests in VIE assets <sup>(d)</sup>	Other <sup>(e)</sup>	Total liabilities
<b>VIE program type</b>							
Bank-sponsored credit card trusts	\$ —	\$ 14,986	\$ 266	\$ 15,252	\$ 6,470	\$ 6	\$ 6,476
Bank-administered multi-seller conduits	1	25,183	355	25,539	9,223	55	9,278
Municipal bond vehicles	1,903	—	4	1,907	1,880	3	1,883
Mortgage securitization entities <sup>(a)</sup>	—	2,762	64	2,826	241	130	371
Other	279	—	24	303	—	177	177
<b>Total</b>	<b>\$ 2,183</b>	<b>\$ 42,931</b>	<b>\$ 713</b>	<b>\$ 45,827</b>	<b>\$ 17,814</b>	<b>\$ 371</b>	<b>\$ 18,185</b>

December 31, 2018 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other <sup>(b)</sup>	Total assets <sup>(c)</sup>	Beneficial interests in VIE assets <sup>(d)</sup>	Other <sup>(e)</sup>	Total liabilities
<b>VIE program type</b>							
Bank-sponsored credit card trusts	\$ —	\$ 31,760	\$ 491	\$ 32,251	\$ 13,437	\$ 12	\$ 13,449
Bank-administered multi-seller conduits	—	24,411	300	24,711	4,842	57	4,899
Municipal bond vehicles	1,779	—	4	1,783	1,749	3	1,752
Mortgage securitization entities <sup>(a)</sup>	—	3,285	40	3,325	281	160	441
Other	131	—	—	131	1	—	1
<b>Total</b>	<b>\$ 1,910</b>	<b>\$ 59,456</b>	<b>\$ 835</b>	<b>\$ 62,201</b>	<b>\$ 20,310</b>	<b>\$ 232</b>	<b>\$ 20,542</b>

(a) Includes residential and commercial mortgage securitizations.

(b) Includes assets classified as cash and other assets on the Consolidated balance sheets.

(c) The assets of the consolidated VIEs included in the program types above are used to settle the liabilities of those entities. The assets and liabilities include third-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation.

(d) The interest-bearing beneficial interest liabilities issued by consolidated VIEs are classified in the line item on the Consolidated balance sheets titled, "Beneficial interests issued by consolidated variable interest entities." The holders of these beneficial interests generally do not have recourse to the general credit of the Bank included in beneficial interests in VIE assets are long-term beneficial interests of \$6.7 billion and \$13.7 billion at December 31, 2019 and 2018, respectively. Refer to Note 20 for additional information on interest-bearing long-term beneficial interests.

(e) Includes liabilities classified as accounts payable and other liabilities on the Consolidated balance sheets.

### **VIEs sponsored by third parties**

The Bank enters into transactions with VIEs structured by other parties. These include, for example, acting as a derivative counterparty, liquidity provider, investor, underwriter, placement agent, remarketing agent, trustee or custodian. These transactions are conducted at arm's-length, and individual credit decisions are based on the analysis of the specific VIE, taking into consideration the quality of the underlying assets. Where the Bank does not have the power to direct the activities of the VIE that most significantly impact the VIE's economic performance, or a variable interest that could potentially be significant, the Bank generally does not consolidate the VIE, but it records and reports these positions on its Consolidated balance sheets in the same manner it would record and report positions in respect of any other third-party transaction.

#### *Tax credit vehicles*

The Bank holds investments in unconsolidated tax credit vehicles, which are limited partnerships and similar entities that own and operate affordable housing, energy, and other projects. These entities are primarily considered VIEs. A third party is typically the general partner or managing member and has control over the significant activities of the tax credit vehicles, and accordingly the Bank does not consolidate tax credit vehicles. The Bank generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits allocated to the projects. The maximum loss exposure, represented by equity investments and funding commitments, was \$8.9 billion and \$7.9 billion, of which \$3.0 billion and \$2.3 billion was unfunded at December 31, 2019 and 2018, respectively. In order to reduce the risk of loss, the Bank assesses each project and withholds varying amounts of its capital investment until the project qualifies for tax credits. Refer to Note 23 for further information on affordable housing tax credits. Refer to Note 26 for more information on off-balance sheet lending-related commitments.

#### **Customer municipal bond vehicles (TOB trusts)**

The Bank may provide various services to customer TOB trusts, including liquidity or tender option provider. In certain customer TOB transactions, the Bank as liquidity provider, has entered into a reimbursement agreement with

the Residual holder. In those transactions, upon the termination of the vehicle, the Bank has recourse to the third-party Residual holders for any shortfall. The Bank does not have any intent to protect Residual holders from potential losses on any of the underlying municipal bonds. The Bank does not consolidate customer TOB trusts, since the Bank does not have the power to make decisions that significantly impact the economic performance of the municipal bond vehicle. The Bank's maximum exposure as a liquidity provider to customer TOB trusts at December 31, 2019 and 2018, was \$5.5 billion and \$4.8 billion, respectively. The fair value of assets held by such VIEs at December 31, 2019 and 2018 was \$8.6 billion and \$7.7 billion, respectively. Refer to Note 26 for more information on off-balance sheet lending-related commitments.

### **Loan securitizations**

The Bank has securitized and sold a variety of loans, including residential mortgage, credit card, and commercial mortgage. The purposes of these securitization transactions were to satisfy investor demand and to generate liquidity for the Bank.

For loan securitizations in which the Bank is not required to consolidate the trust, the Bank records the transfer of the loan receivable to the trust as a sale when all of the following accounting criteria for a sale are met: (1) the transferred financial assets are legally isolated from the Bank's creditors; (2) the transferee or beneficial interest holder can pledge or exchange the transferred financial assets; and (3) The Bank does not maintain effective control over the transferred financial assets (e.g., the Bank cannot repurchase the transferred assets before their maturity and it does not have the ability to unilaterally cause the holder to return the transferred assets).

For loan securitizations accounted for as a sale, the Bank recognizes a gain or loss based on the difference between the value of proceeds received (including cash, beneficial interests, or servicing assets received) and the carrying value of the assets sold. Gains and losses on securitizations are reported in noninterest revenue.

## Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
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### Securitization activity

The following table provides information related to the Bank's securitization activities for the years ended December 31, 2019, 2018 and 2017, related to assets held in Bank-sponsored securitization entities that were not consolidated by the Bank, and where sale accounting was achieved at the time of the securitization.

Year ended December 31, (in millions)	2019		2018		2017	
	Residential mortgage <sup>(c)</sup>	Commercial and other <sup>(d)</sup>	Residential mortgage <sup>(c)</sup>	Commercial and other <sup>(d)</sup>	Residential mortgage <sup>(c)</sup>	Commercial and other <sup>(d)</sup>
Principal securitized	\$ 9,957	\$ 9,390	\$ 6,431	\$ 10,159	\$ 5,532	\$ 10,252
<b>All cash flows during the period:</b>						
Proceeds received from loan sales as cash or financial instruments <sup>(a)</sup>	\$ 10,238	\$ 9,544	\$ 6,449	\$ 10,218	\$ 5,661	\$ 10,337
Servicing fees collected	287	2	319	2	338	2
Purchases of previously transferred financial assets (or the underlying collateral) <sup>(b)</sup>	—	—	—	—	1	—
Cash flows received on interests	410	131	273	155	383	632

(a) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale. The proceeds received were primarily cash.

(b) Includes cash paid by the Bank to reacquire assets from nonconsolidated entities - for example, loan repurchases due to representation and warranties and servicer "clean-up calls".

(c) Includes prime mortgages only. Excludes loan securitization activity related to U.S. GSEs and government agencies.

(d) Includes commercial mortgage and other consumer loans.

Key assumptions used to value retained interests originated during the year are shown in the table below.

Year ended December 31,	2019	2018	2017
<b>Residential mortgage retained interest:</b>			
Weighted-average life (in years)	5.2	6.7	3.8
Weighted-average discount rate	3.7%	4.7%	3.0%
<b>Commercial mortgage retained interest:</b>			
Weighted-average life (in years)	6.5	4.2	5.3
Weighted-average discount rate	4.1%	3.7%	4.7%

### Loans and excess MSR's sold to U.S. government-sponsored enterprises and loans in securitization transactions pursuant to Ginnie Mae guidelines

In addition to the amounts reported in the securitization activity tables above, the Bank, in the normal course of business, sells originated and purchased mortgage loans and certain originated excess MSR's on a nonrecourse basis, predominantly to U.S. GSEs. These loans and excess MSR's are sold primarily for the purpose of securitization by the U.S. GSEs, who provide certain guarantee provisions (e.g., credit enhancement of the loans). The Bank also sells loans into securitization transactions pursuant to Ginnie Mae guidelines; these loans are typically insured or guaranteed by another U.S. government agency. The Bank does not consolidate the securitization vehicles underlying these transactions as it is not the primary beneficiary. For a limited number of loan sales, the Bank is obligated to share a portion of the credit risk associated with the sold loans with the purchaser. Refer to Note 26 for additional information about the Bank's loan sales- and securitization-related indemnifications. Refer to Note 16 for additional information about the impact of the Bank's sale of certain excess MSR's.

The following table summarizes the activities related to loans sold to the U.S. GSEs, and loans in securitization transactions pursuant to Ginnie Mae guidelines.

Year ended December 31, (in millions)	2019	2018	2017
Carrying value of loans sold	\$ 92,349	\$ 44,609	\$ 64,542
Proceeds received from loan sales as cash	\$ 73	\$ 9	\$ 117
Proceeds from loan sales as securities <sup>(a)(b)</sup>	91,422	43,671	63,542
<b>Total proceeds received from loan sales<sup>(c)</sup></b>	<b>\$ 91,495</b>	<b>\$ 43,680</b>	<b>\$ 63,659</b>
Gains/(losses) on loan sales <sup>(d)(e)</sup>	\$ 499	\$ (93)	\$ 163

- (a) Includes securities from U.S. GSEs and Ginnie Mae that are generally sold shortly after receipt or retained as part of the Bank's investment securities portfolio.  
(b) Included in level 2 assets.  
(c) Excludes the value of MSRs retained upon the sale of loans.  
(d) Gains/(losses) on loan sales include the value of MSRs.  
(e) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.

#### Options to repurchase delinquent loans

In addition to the Bank's obligation to repurchase certain loans due to material breaches of representations and warranties as discussed in Note 26. The Bank also has the option to repurchase delinquent loans that it services for Ginnie Mae loan pools, as well as for other U.S. government agencies under certain arrangements. The Bank typically elects to repurchase delinquent loans from Ginnie Mae loan pools as it continues to service them and/or manage the foreclosure process in accordance with the applicable requirements, and such loans continue to be insured or guaranteed. When the Bank's repurchase option becomes exercisable, such loans must be reported on the Consolidated balance sheets as a loan with a corresponding liability. Refer to Note 13 for additional information.

The following table presents loans the Bank repurchased or had an option to repurchase, real estate owned, and foreclosed government-guaranteed residential mortgage loans recognized on the Bank's Consolidated balance sheets as of December 31, 2019 and 2018. Substantially all of these loans and real estate are insured or guaranteed by U.S. government agencies.

December 31, (in millions)	2019	2018
Loans repurchased or option to repurchase <sup>(a)</sup>	\$ 2,933	\$ 7,010
Real estate owned	41	75
Foreclosed government-guaranteed residential mortgage loans <sup>(b)</sup>	198	361

- (a) Predominantly all of these amounts relate to loans that have been repurchased from Ginnie Mae loan pools.  
(b) Relates to voluntary repurchases of loans, which are included in accrued interest and accounts receivable.

#### Loan delinquencies and liquidation losses

The table below includes information about components of nonconsolidated securitized financial assets held in Bank-sponsored private-label securitization entities, in which the Bank has continuing involvement, and delinquencies as of December 31, 2019 and 2018.

As of or for the year ended December 31, (in millions)	Securitized assets		90 days past due		Net liquidation losses <sup>(a)</sup>	
	2019	2018	2019	2018	2019	2018
<b>Securitized loans</b>						
Residential mortgage:						
Prime/ Alt-A & option ARMs	\$ 37,602	\$ 36,731	\$ 1,673	\$ 2,253	\$ 370	\$ 365
Subprime	9,338	10,605	1,170	1,567	367	(374)
Commercial and other	31,453	24,580	86	26	1	—
<b>Total loans securitized</b>	<b>\$ 78,393</b>	<b>\$ 71,916</b>	<b>\$ 2,929</b>	<b>\$ 3,846</b>	<b>\$ 738</b>	<b>\$ (9)</b>

- (a) Includes liquidation gains as a result of private label mortgage settlement payments during the first half of 2018, which were reflected as asset recoveries by trustees.

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### Note 16 – Goodwill and Mortgage servicing rights

#### Goodwill

Goodwill is recorded upon completion of a business combination as the difference between the purchase price and the fair value of the net assets acquired. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment during the fourth quarter of each fiscal year, or more often if events or circumstances, such as adverse changes in the business climate, indicate there may be impairment.

The following table presents changes in the carrying amount of goodwill.

Year ended December 31, (in millions)	2019	2018	2017
Balance at beginning of period <sup>(a)</sup>	\$ 39,710	\$ 39,746	\$ 39,527
Changes during the period from:			
Business combinations <sup>(b)</sup>	349	–	199
Other <sup>(c)</sup>	3	(36)	20
<b>Balance at December 31,<sup>(a)</sup></b>	<b>\$ 40,062</b>	<b>\$ 39,710</b>	<b>\$ 39,746</b>

(a) Reflects gross goodwill balances as the Bank has not recognized any impairment losses to date.

(b) For 2019, represents goodwill associated with the acquisition of InstaMed a U.S. technology company specializing in healthcare payments. For 2017, represents goodwill in connection with an acquisition.

(c) Primarily relates to foreign currency adjustments.

#### Goodwill impairment testing

Goodwill was not impaired at December 31, 2019, 2018 and 2017.

The goodwill impairment test is performed in two steps. In the first step, the current fair value of the Bank is compared with its carrying value. If the fair value is in excess of the carrying value, then the 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 goodwill is determined by comparing the fair value of the Bank (as determined in step one) to the fair value of the net assets of the Bank as if it was being acquired in a business combination. The resulting implied current fair value of goodwill is then compared with the carrying value of the Bank'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 values of the Bank's, 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.

#### Mortgage servicing rights

MSRs represent the fair value of expected future cash flows for performing servicing activities for others. The fair value considers estimated future servicing fees and ancillary revenue, offset by estimated costs to service the loans, and generally declines over time as net servicing cash flows are received, effectively amortizing the MSR asset against contractual servicing and ancillary fee income. MSRs are either purchased from third parties or recognized upon sale or securitization of mortgage loans if servicing is retained.

As permitted by U.S. GAAP, the Bank has elected to account for its MSRs at fair value. The Bank treats its MSRs as a single class of servicing assets based on the availability of market inputs used to measure the fair value of its MSR asset and its treatment of MSRs as one aggregate pool for risk management purposes. The Bank estimates the fair value of MSRs using an option-adjusted spread ("OAS") model, which projects MSR cash flows over multiple interest rate scenarios in conjunction with the Bank's prepayment model, and then discounts these cash flows at risk-adjusted rates. The model considers portfolio characteristics, contractually specified servicing fees, prepayment assumptions, delinquency rates, costs to service, late charges and other ancillary revenue, and other economic factors. The Bank compares fair value estimates and assumptions to observable market data where available, and also considers recent market activity and actual portfolio experience.

The fair value of MSRs is sensitive to changes in interest rates, including their effect on prepayment speeds. MSRs typically decrease in value when interest rates decline because declining interest rates tend to increase prepayments and therefore reduce the expected life of the net servicing cash flows that comprise the MSR asset. Conversely, securities (e.g., mortgage-backed securities), principal-only certificates and certain derivatives (i.e., those for which the Bank receives fixed-rate interest payments) increase in value when interest rates decline. The Bank uses combinations of derivatives and securities to manage the risk of changes in the fair value of MSRs. The intent is to offset any interest-rate related changes in the fair value of MSRs with changes in the fair value of the related risk management instruments.

The following table summarizes MSR activity for the years ended December 31, 2019, 2018 and 2017.

As of or for the year ended December 31, (in millions, except where otherwise noted)	2019	2018	2017
Fair value at beginning of period	\$ 6,130	\$ 6,030	\$ 6,096
MSR activity:			
Originations of MSRs	1,384	931	1,103
Purchase of MSRs	105	315	–
Disposition of MSRs <sup>(a)</sup>	(789)	(636)	(140)
<b>Net additions</b>	<b>700</b>	<b>610</b>	<b>963</b>
Changes due to collection/realization of expected cash flows	(951)	(740)	(797)
Changes in valuation due to inputs and assumptions:			
Changes due to market interest rates and other <sup>(b)</sup>	(893)	300	(202)
Changes in valuation due to other inputs and assumptions:			
Projected cash flows (e.g., cost to service)	(333) <sup>(e)</sup>	15	(102)
Discount rates	153	24	(19)
Prepayment model changes and other <sup>(c)</sup>	(107)	(109)	91
<b>Total changes in valuation due to other inputs and assumptions</b>	<b>(287)</b>	<b>(70)</b>	<b>(30)</b>
<b>Total changes in valuation due to inputs and assumptions</b>	<b>(1,180)</b>	<b>230</b>	<b>(232)</b>
<b>Fair value at December 31,</b>	<b>\$ 4,699</b>	<b>\$ 6,130</b>	<b>\$ 6,030</b>
Change in unrealized gains/(losses) included in income related to MSRs held at December 31,	\$ (1,180)	\$ 230	\$ (232)
Contractual service fees, late fees and other ancillary fees included in income	1,639	1,778	1,886
Third-party mortgage loans serviced at December 31, (in billions)	522.0	521.0	555.0
Servicer advances, net of an allowance for uncollectible amounts, at December 31, (in billions) <sup>(d)</sup>	2.0	3.0	4.0

- (a) Includes excess MSRs transferred to agency-sponsored trusts in exchange for stripped mortgage backed securities (“SMBS”). In each transaction, a portion of the SMBS was acquired by third parties at the transaction date; the Bank acquired the remaining balance of those SMBS as trading securities.
- (b) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
- (c) Represents changes in prepayments other than those attributable to changes in market interest rates.
- (d) Represents amounts the Bank pays as the servicer (e.g., scheduled principal and interest, taxes and insurance), which will generally be reimbursed within a short period of time after the advance from future cash flows from the trust or the underlying loans. The Bank’s credit risk associated with these servicer advances is minimal because reimbursement of the advances is typically senior to all cash payments to investors. In addition, the Bank maintains the right to stop payment to investors if the collateral is insufficient to cover the advance. However, certain of these servicer advances may not be recoverable if they were not made in accordance with applicable rules and agreements.
- (e) The decrease in projected cash flows was largely related to default servicing assumption updates.

The following table presents the components of mortgage fees and related income (including the impact of MSR risk management activities) for the years ended December 31, 2019, 2018 and 2017.

Year ended December 31, (in millions)	2019	2018	2017
<b>Mortgage fees and related income</b>			
<b>Net production revenue</b>	<b>\$ 1,618</b>	<b>\$ 268</b>	<b>\$ 636</b>
<b>Net mortgage servicing revenue:</b>			
Operating revenue:			
Loan servicing revenue	1,533	1,835	2,014
Changes in MSR asset fair value due to collection/realization of expected cash flows	(951)	(740)	(795)
<b>Total operating revenue</b>	<b>582</b>	<b>1,095</b>	<b>1,219</b>
Risk management:			
Changes in MSR asset fair value due to market interest rates and other <sup>(a)</sup>	(893)	300	(202)
Other changes in MSR asset fair value due to other inputs and assumptions in model <sup>(b)</sup>	(287)	(70)	(30)
Change in derivative fair value and other	1,015	(341)	(10)
<b>Total risk management</b>	<b>(165)</b>	<b>(111)</b>	<b>(242)</b>
<b>Total net mortgage servicing revenue</b>	<b>417</b>	<b>984</b>	<b>977</b>
Other	1	1	3
<b>Mortgage fees and related income</b>	<b>\$ 2,036</b>	<b>\$ 1,253</b>	<b>\$ 1,616</b>

- (a) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
- (b) Represents the aggregate impact of changes in model inputs and assumptions such as projected cash flows (e.g., cost to service), discount rates and changes in prepayments other than those attributable to changes in market interest rates (e.g., changes in prepayments due to changes in home prices).

The table below outlines the key economic assumptions used to determine the fair value of the Bank’s MSRs at December 31, 2019 and 2018, and outlines the sensitivities of those fair values to immediate adverse changes in those assumptions, as defined below.

December 31, (in millions, except rates)	2019	2018
Weighted-average prepayment speed assumption (constant prepayment rate)	11.67%	8.78%
Impact on fair value of 10% adverse change	\$ (200)	\$ (205)
Impact on fair value of 20% adverse change	(384)	(397)
Weighted-average option adjusted spread <sup>(a)</sup>	7.93%	7.87%
Impact on fair value of 100 basis points adverse change	\$ (169)	\$ (235)
Impact on fair value of 200 basis points adverse change	(326)	(452)

- (a) Includes the impact of operational risk and regulatory capital.

Changes in fair value based on variations in assumptions generally cannot be easily extrapolated, because the relationship of the change in the assumptions to the change

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in fair value are often highly interrelated and may not be linear. In this table, the effect that a change in a particular assumption may have on the fair value is calculated without changing any other assumption. In reality, changes in one factor may result in changes in another, which would either magnify or counteract the impact of the initial change.

### Note 17 - Premises and equipment

Premises and equipment, including leasehold improvements, are carried at cost less accumulated depreciation and amortization. The Bank computes depreciation using the straight-line method over the estimated useful life of an asset. For leasehold improvements, the Bank uses the straight-line method computed over the lesser of the remaining term of the leased facility or the estimated useful life of the leased asset.

The Bank capitalizes certain costs associated with the acquisition or development of internal-use software. Once the software is ready for its intended use, these costs are amortized on a straight-line basis over the software's expected useful life and reviewed for impairment on an ongoing basis.

### Note 18 - Deposits

At December 31, 2019 and 2018, noninterest-bearing and interest-bearing deposits were as follows.

December 31, (in millions)	2019	2018
<b>U.S. offices</b>		
Noninterest-bearing (included \$22,710 and \$17,353 at fair value) <sup>(a)(b)</sup>	\$ 399,038	\$ 389,786
Interest-bearing (included \$2,534 and \$2,492 at fair value) <sup>(a)(b)</sup>	955,393	890,800
<b>Total deposits in U.S. offices</b>	<b>1,354,431</b>	<b>1,280,586</b>
<b>Non-U.S. offices</b>		
Noninterest-bearing (included \$1,980 and \$2,367 at fair value) <sup>(a)(b)</sup>	20,997	22,731
Interest-bearing (included \$1,438 and \$1,159 at fair value) <sup>(a)(b)</sup>	275,060	254,094
<b>Total deposits in non-U.S. offices</b>	<b>296,057</b>	<b>276,825</b>
<b>Total deposits</b>	<b>\$ 1,650,488</b>	<b>\$ 1,557,411</b>

(a) Includes structured notes classified as deposits for which the fair value option has been elected. Refer to Note 4 for further discussion.

(b) During the first half of 2019, the Bank reclassified balances related to certain structured notes from interest-bearing to noninterest-bearing deposits as the associated returns are recorded in principal transactions revenue and not in net interest income. This change was applied retrospectively and, accordingly, prior period amounts were revised to conform with the current presentation.

At December 31, 2019 and 2018, time deposits in denominations of \$250,000 or more were as follows.

December 31, (in millions)	2019	2018
U.S. offices	\$ 56,184	\$ 36,271
Non-U.S. offices	51,375	42,687
<b>Total</b>	<b>\$ 107,559</b>	<b>\$ 78,958</b>

At December 31, 2019, the maturities of interest-bearing time deposits were as follows.

December 31, 2019 (in millions)	U.S.	Non-U.S.	Total
2020	\$ 60,615	\$ 49,971	\$ 110,586
2021	15,756	123	15,879
2022	709	98	807
2023	175	26	201
2024	534	357	891
After 5 years	301	39	340
<b>Total</b>	<b>\$ 78,090</b>	<b>\$ 50,614</b>	<b>\$ 128,704</b>

## Note 19 – Leases

### Lease commitments

Effective January 1, 2019, the Bank adopted new guidance that requires lessees to recognize on the Consolidated balance sheets all leases with lease terms greater than twelve months as a lease liability with a corresponding right-of-use (“ROU”) asset. Accordingly, the Bank recognized operating lease liabilities and ROU assets of \$7.8 billion and \$7.4 billion, respectively. The adoption of the new lease guidance did not have a material impact on the Bank’s Consolidated statements of income. The change in accounting due to the adoption of the new lease guidance did not result in a material change to the future net minimum rental payments/receivables or to the net rental expense when compared to December 31, 2018.

### The Bank as lessee

At December 31, 2019, the Bank and its subsidiaries were obligated under a number of noncancelable leases, predominantly operating leases for premises and equipment used primarily for business purposes. These leases generally have terms of 20 years or less, determined based on the contractual maturity of the lease, and include periods covered by options to extend or terminate the lease when the Bank is reasonably certain that it will exercise those options. None of these lease agreements impose restrictions on the Bank’s ability to pay dividends, engage in debt or equity financing transactions or enter into further lease agreements. Certain of these leases contain escalation clauses that will increase rental payments based on maintenance, utility and tax increases, which are non-lease components. The Bank elected not to separate lease and non-lease components of a contract for its real estate leases. As such, real estate lease payments represent payments on both lease and non-lease components.

Operating lease liabilities and ROU assets are recognized at the lease commencement date based on the present value of the future minimum lease payments over the lease term. The future lease payments are discounted at a rate that represents the Bank’s collateralized borrowing rate for financing instruments of a similar term and are included in accounts payable and other liabilities. The operating lease ROU asset, included in premises and equipment, also includes any lease prepayments made, plus initial direct costs incurred, less any lease incentives received. Rental expense associated with operating leases is recognized on a straight-line basis over the lease term, and generally included in occupancy expense in the Consolidated statements of income.

The following tables provide information related to the Bank’s operating leases:

December 31, (in millions, except where otherwise noted)	2019
Right-of-use assets	\$ 7,545
Lease liabilities	8,108
Weighted average remaining lease term (in years)	8.9
Weighted average discount rate	3.61%
<b>Supplemental cash flow information</b>	
Cash paid for amounts included in the measurement of lease liabilities - operating cash flows	\$ 1,477
<b>Supplemental non-cash flow information</b>	
Right-of-use assets obtained in exchange for operating lease obligations	\$ 1,384

Year ended December 31, (in millions)	2019
<b>Rental expense</b>	
Gross rental expense	\$ 1,917
Sublease rental income	(156)
<b>Net rental expense</b>	<b>\$ 1,761</b>

The following table presents future payments under operating leases as of December 31, 2019:

Year ended December 31, (in millions)	
2020	\$ 1,511
2021	1,369
2022	1,184
2023	1,016
2024	893
After 2024	3,660
<b>Total future minimum lease payments</b>	<b>9,633</b>
Less: Imputed interest	(1,525)
<b>Total</b>	<b>\$ 8,108</b>

In addition to the table above, as of December 31, 2019, the Bank had additional future operating lease commitments of \$920 million that were signed but had not yet commenced. These operating leases will commence between 2020 and 2022 with lease terms up to 25 years.

### The Bank as lessor

The Bank provides auto and equipment lease financing to its customers through lease arrangements with lease terms that may contain renewal, termination and/or purchase options. Generally, the Bank’s lease financings are operating leases. These assets are recognized in other assets on the Bank’s Consolidated balance sheets and are depreciated on a straight-line basis over the lease term to reduce the asset to its estimated residual value. Depreciation expense is included in technology, communications and equipment expense in the Consolidated statements of income. The Bank’s lease income is generally recognized on a straight-line basis over the lease term and is included in other income in the Consolidated statements of income.

On a periodic basis, the Bank assesses leased assets for impairment, and if the carrying amount of the leased asset exceeds the undiscounted cash flows from the lease payments and the estimated residual value upon disposition of the leased asset, an impairment loss is recognized.

The risk of loss on auto and equipment leased assets relating to the residual value of the leased assets is monitored through projections of the asset residual values at lease origination and periodic review of residual values, and is mitigated through arrangements with certain manufacturers or lessees.

The following table presents the carrying value of assets subject to leases reported on the Consolidated balance sheets:

December 31, (in millions)	2019	2018
Carrying value of assets subject to operating leases, net of accumulated depreciation	\$ 23,585	\$ 21,408
Accumulated depreciation	6,121	5,298

The following table presents the Bank's operating lease income and the related depreciation expense on the Consolidated statements of income:

Year ended December 31, (in millions)	2019	2018	2017
Operating lease income	\$ 5,448	\$ 4,529	3,604
Depreciation expense	4,152	3,517	2,808

The following table presents future receipts under operating leases as of December 31, 2019:

Year ended December 31, (in millions)	
2020	\$ 4,160
2021	2,725
2022	1,017
2023	81
2024	36
After 2024	51
<b>Total future minimum lease receipts</b>	<b>\$ 8,070</b>

## Note 20 – Long-term debt

The Bank issues long-term debt denominated in various currencies, predominantly U.S. dollars, with both fixed and variable interest rates. Included in senior and subordinated debt below are various equity-linked or other indexed instruments, which the Bank has elected to measure at fair value. Changes in fair value are recorded in principal transactions revenue in the Consolidated statements of income, except for unrealized gains/(losses) due to DVA which are recorded in OCI. The following table is a summary of long-term debt carrying values (including unamortized premiums and discounts, issuance costs, valuation adjustments and fair value adjustments, where applicable) by remaining contractual maturity as of December 31, 2019.

By remaining maturity at December 31, (in millions, except rates)	2019				2018	
	Under 1 year	1-5 years	After 5 years	Total	Total	
<b>Long-term debt payable to JPMorgan Chase &amp; Co. and affiliates</b>						
Senior debt:	Variable rate	\$ 482	\$ 37,240	\$ 47	\$ 37,769	\$ 20,473
	Interest rates <sup>(a)</sup>	—%	2.15-2.28%	—%	2.15-2.28%	2.99%
Subordinated debt:	Variable rate	\$ —	\$ 2,500	\$ 1,000	\$ 3,500	\$ 3,500
	Interest rates <sup>(a)</sup>	—%	3.38%	2.85%	2.85-3.38%	3.18-3.69%
	<b>Subtotal</b>	<b>\$ 482</b>	<b>\$ 39,740</b>	<b>\$ 1,047</b>	<b>\$ 41,269</b>	<b>\$ 23,973</b>
<b>Long-term debt issued to unrelated parties</b>						
Federal Home Loan Banks (“FHLB”) advances:	Fixed rate	\$ 4	\$ 35	\$ 96	\$ 135	\$ 155
	Variable rate	9,500	19,000	—	28,500	44,300
	Interest rates <sup>(a)</sup>	1.88-2.18%	1.67-2.24%	—%	1.67-2.24%	2.36-2.96%
Senior debt:	Fixed rate	\$ 746	\$ 6,703	\$ 11,826	\$ 19,275	\$ 16,418
	Variable rate	6,786	17,253	8,196	32,235	25,089
	Interest rates <sup>(a)</sup>	7.50%	2.15-9.43%	1.00-7.50%	1.00-9.43%	1.00-7.50%
Subordinated debt:	Fixed rate	\$ —	\$ 305	\$ —	\$ 305	\$ 301
	Interest rates <sup>(a)</sup>	—%	8.25%	—%	8.25%	8.25%
	<b>Subtotal</b>	<b>\$ 17,036</b>	<b>\$ 43,296</b>	<b>\$ 20,118</b>	<b>\$ 80,450</b>	<b>\$ 86,263</b>
<b>Total long-term debt<sup>(b)(c)(d)</sup></b>		<b>\$ 17,518</b>	<b>\$ 83,036</b>	<b>\$ 21,165</b>	<b>\$ 121,719</b>	<b>\$ 110,236</b>
<b>Long-term beneficial interests:</b>						
	Fixed rate	\$ 1,624	\$ 1,373	\$ —	\$ 2,997	\$ 7,644
	Variable rate	900	2,572	241	3,713	6,074
	Interest rates	1.49-2.04%	1.94-2.77%	0.84-3.75%	0.84-3.75%	1.27-3.75%
<b>Total long-term beneficial interests<sup>(e)</sup></b>		<b>\$ 2,524</b>	<b>\$ 3,945</b>	<b>\$ 241</b>	<b>\$ 6,710</b>	<b>\$ 13,718</b>

- (a) The interest rates shown are the range of contractual rates in effect at December 31, 2019 and 2018, respectively, including non-U.S. dollar fixed- and variable-rate issuances, which excludes the effects of the associated derivative instruments used in hedge accounting relationships, if applicable. The use of these derivative instruments modifies the Bank's exposure to the contractual interest rates disclosed in the table above. Including the effects of the hedge accounting derivatives, the range of modified rates in effect at December 31, 2019, for total long-term debt was 1.00% to 9.43%, versus the contractual range of 1.00% to 9.43% presented in the table above. The interest rate ranges shown exclude structured notes accounted for at fair value.
- (b) Included long-term debt of \$32.0 billion and \$47.7 billion secured by assets totaling \$186.1 billion and \$207.0 billion at December 31, 2019 and 2018, respectively. The amount of long-term debt secured by assets does not include amounts related to hybrid instruments.
- (c) Included \$40.3 billion and \$26.6 billion of long-term debt accounted for at fair value at December 31, 2019 and 2018, respectively.
- (d) Included \$3.3 billion and \$2.7 billion of outstanding zero-coupon notes at December 31, 2019 and 2018, respectively. The aggregate principal amount of these notes at their respective maturities is \$6.5 billion and \$5.5 billion, respectively. The aggregate principal amount reflects the contractual principal payment at maturity, which may exceed the contractual principal payment at the Bank's next call date, if applicable.
- (e) Included on the Consolidated balance sheets in beneficial interests issued by consolidated VIEs. Excluded short-term commercial paper and other short-term beneficial interests of \$11.1 billion and \$6.6 billion at December 31, 2019 and 2018, respectively.
- (f) At December 31, 2019, long-term debt in the aggregate of \$21.6 billion was redeemable at the option of the Bank in whole or in part, prior to maturity, based on the terms specified in the respective instruments.
- (g) The aggregate carrying values of debt that matures in each of the five years subsequent to 2019 is \$17.5 billion in 2020, \$59.4 billion in 2021, \$5.0 billion in 2022, \$9.2 billion in 2023 and \$9.5 billion in 2024.

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The weighted-average contractual interest rates for total long-term debt excluding structured notes accounted for at fair value were 2.24% and 2.85% as of December 31, 2019 and 2018, respectively. In order to modify exposure to interest rate movements, the Bank utilizes derivative instruments, primarily interest rate swaps, in conjunction with some of its debt issuances. The use of these instruments modifies the Bank's interest expense on the associated debt. The modified weighted-average interest rates for total long-term debt, including the effects of related derivative instruments, were 2.23% and 2.85% as of December 31, 2019 and 2018, respectively.

### Note 21 – Related party transactions

JPMorgan Chase Bank, N.A. regularly enters into transactions with JPMorgan Chase and its various subsidiaries collectively, JPMorgan Chase affiliates. The following discussion summarizes the more significant types of transactions.

#### Securities financing activities

Securities financing activities include resale, repurchase, securities borrowed and securities loaned agreements entered into with JPMorgan Chase affiliates. Interest accrued in connection with securities financing agreements is recorded in interest income and interest expense. Refer to Note 12 for further discussion of securities financing activities.

#### Deposits

JPMorgan Chase affiliates may deposit excess funds into noninterest-bearing, interest-bearing demand or time deposit accounts with the Bank. Interest accrued on interest bearing deposits is recorded in interest expense by the Bank. Refer to Note 18 for further discussion of deposits.

#### Long-term debt

The Bank issues long-term debt to JPMorgan Chase affiliates as part of JPMorgan Chase's liquidity management strategy. Interest accrued on long-term debt is recorded in interest

The Bank's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Bank's credit ratings, financial ratios or earnings.

expense. Refer to Note 20 for further discussion of long-term debt.

#### Derivative transactions

The Bank executes derivative transactions with JPMorgan Chase affiliates as part of its client driven market-making activities and to facilitate hedging certain risks for its affiliates. To accomplish this, the Bank predominantly enters into offsetting derivative transactions with third-parties and records both the third party and related-party gains and losses in principal transactions revenue. Refer to Note 6 for further discussion of derivatives activities.

#### Servicing agreements and fee arrangements

Through servicing agreements, the Bank provides and receives operational support and services to and from JPMorgan Chase affiliates. These servicing agreements cover certain occupancy, marketing, communication and technology services, and other shared corporate service costs. The Bank is allocated or allocates a share of the cost of the services over the relevant service period based on the agreed methodology. Fees earned by the Bank for services provided to affiliates are recorded in all other income, and fees incurred by the Bank for services from affiliates are recorded in noninterest expense.

Significant revenue- and expense-related transactions with these related parties are listed below.

Year ended December 31, (in millions)	2019	2018	2017
Interest income and Interest expense			
Interest income	\$ 2,726	\$ 911	\$ 358
Interest expense	3,799	2,498	1,478
<b>Net interest income</b>	<b>(1,073)</b>	<b>(1,587)</b>	<b>(1,120)</b>
Noninterest revenue			
Principal transactions	(8,517)	415	1,871
All other income <sup>(a)</sup>	5,700	4,624	4,220
<b>Total noninterest revenue</b>	<b>(2,817)</b>	<b>5,039</b>	<b>6,091</b>
<b>Noninterest expense<sup>(b)</sup></b>	<b>4,862</b>	<b>4,938</b>	<b>4,305</b>

Significant balances with these related parties are listed below.

December 31, (in millions)	2019	2018
<b>Assets</b>		
Federal funds sold and securities purchased under resale agreements	\$ 89,304	\$ 92,313
Accrued interest and accounts receivable	20,163	16,267
All other assets	4,457	4,546
<b>Liabilities</b>		
Deposits <sup>(c)</sup>	87,984	86,651
Federal funds purchased and securities loaned or sold under repurchase agreements	58,016	52,823
Accounts payable and other liabilities	10,993	10,612
Long-term debt	41,269	23,973

(a) Includes fees earned by the Bank for services provided to JPMorgan Chase affiliates of \$4.6 billion, \$3.4 billion and \$3.2 billion for the years ended December 31, 2019, 2018 and 2017, respectively.

(b) Includes fees incurred for services provided by JPMorgan Chase affiliates of \$1.7 billion, \$1.9 billion and \$1.6 billion for the years ended December 31, 2019, 2018 and 2017.

(c) At December 31, 2019 and 2018, includes \$20.0 billion and \$20.2 billion that was pledged to support extensions of credit and other transactions requiring collateral with JPMorgan Chase as defined by Section 23A under the Federal Reserve Act, which defines the constraints that apply to U.S. banks in certain of their interactions with affiliates.

The following table summarizes information on derivative receivables and payables with JPMorgan Chase affiliates before and after netting adjustments for legally enforceable master netting agreements as of December 31, 2019 and December 31, 2018.

December 31, (in millions)	2019		2018	
	Gross derivative receivable/payable	Net derivative receivable/payable	Gross derivative receivable/payable	Net derivative receivable/payable
Derivative receivables from affiliates	\$ 53,231	\$ 265	\$ 44,162	\$ 331
Derivative payables to affiliates	56,532	51	42,131	124

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### Note 22 – Accumulated other comprehensive income/(loss)

AOCI includes the after-tax change in unrealized gains and losses on investment securities, foreign currency translation adjustments (including the impact of related derivatives), fair value changes of excluded components on fair value hedges, cash flow hedging activities, net loss and prior service costs/(credit) related to the Bank's defined benefit pension and OPEB plans, and fair value option-elected liabilities arising from changes in the Bank's own credit risk (DVA).

Year end December 31, (in millions)	Unrealized gains/(losses) on investment securities	Translation adjustments, net of hedges	Fair value hedges	Cash flow hedges	Defined benefit pension and OPEB plans	DVA on fair value option elected liabilities	Accumulated other comprehensive income/(loss)
Balance at December 31, 2016	\$ 1,396	\$ (36)	NA	\$ (100)	\$ (355)	\$ (40)	\$ 865
Net change	687	(309)	NA	176	11	(55)	510
Balance at December 31, 2017	\$ 2,083	\$ (345)	NA	\$ 76	\$ (344)	\$ (95)	\$ 1,375
Cumulative effect of changes in accounting principles <sup>(a)</sup>	870	(193)	(1)	16	(65)	(21)	606
Net change	(1,806)	57	1	(198)	(1,969)	321	(3,594)
Balance at December 31, 2018	\$ 1,147	\$ (481)	\$ –	\$ (106)	\$ (2,378)	\$ 205	\$ (1,613)
<b>Net change</b>	<b>2,869</b>	<b>(4)</b>	<b>–</b>	<b>167</b>	<b>656</b>	<b>(319)</b>	<b>3,369</b>
<b>Balance at December 31, 2019</b>	<b>\$ 4,016</b>	<b>\$ (485)</b>	<b>\$ –</b>	<b>\$ 61</b>	<b>\$ (1,722)</b>	<b>\$ (114)</b>	<b>\$ 1,756</b>

(a) Represents the adjustment to AOCI as a result of the accounting standards adopted January 1, 2018. Refer to Note 1 for additional information.

The following table presents the pre-tax and after-tax changes in the components of OCI.

Year ended December 31, (in millions)	2019			2018			2017		
	Pretax	Tax effect	After-tax	Pretax	Tax effect	After-tax	Pretax	Tax effect	After-tax
<b>Unrealized gains/(losses) on investment securities:</b>									
Net unrealized gains/(losses) arising during the period	\$ 4,037	\$ (976)	\$ 3,061	\$(2,757)	\$ 649	\$(2,108)	\$ 1,012	\$ (371)	\$ 641
Reclassification adjustment for realized (gains)/losses included in net income <sup>(a)</sup>	(253)	61	(192)	395	(93)	302	73	(27)	46
<b>Net change</b>	<b>3,784</b>	<b>(915)</b>	<b>2,869</b>	<b>(2,362)</b>	<b>556</b>	<b>(1,806)</b>	<b>1,085</b>	<b>(398)</b>	<b>687</b>
<b>Translation adjustments<sup>(b)</sup>:</b>									
Translation	(126)	26	(100)	(797)	118	(679)	844	(616)	228
Hedges	126	(30)	96	964	(228)	736	(847)	310	(537)
<b>Net change</b>	<b>—</b>	<b>(4)</b>	<b>(4)</b>	<b>167</b>	<b>(110)</b>	<b>57</b>	<b>(3)</b>	<b>(306)</b>	<b>(309)</b>
<b>Fair value hedges, net change<sup>(c)</sup>:</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>1</b>	<b>—</b>	<b>1</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
<b>Cash flow hedges:</b>									
Net unrealized gains/(losses) arising during the period	118	(29)	89	(243)	58	(185)	147	(55)	92
Reclassification adjustment for realized (gains)/losses included in net income <sup>(d)</sup>	102	(24)	78	(17)	4	(13)	134	(50)	84
<b>Net change</b>	<b>220</b>	<b>(53)</b>	<b>167</b>	<b>(260)</b>	<b>62</b>	<b>(198)</b>	<b>281</b>	<b>(105)</b>	<b>176</b>
<b>Defined benefit pension and OPEB plans:</b>									
Transfer from JPMorgan Chase	—	—	—	(2,123)	500	(1,623)	—	—	—
Prior service credit/(cost) arising during the period	(5)	1	(4)	(29)	7	(22)	—	—	—
Net gain/(loss) arising during the period	709	(171)	538	(500)	120	(380)	38	(14)	24
Reclassification adjustments included in net income <sup>(e)</sup> :									
Amortization of net loss	166	(36)	130	99	(20)	79	34	(12)	22
Amortization of prior service cost/(credit)	3	(1)	2	(23)	5	(18)	(2)	1	(1)
Curtailment (gain)/loss	—	—	—	21	(5)	16	—	—	—
Settlement (gain)/loss	—	—	—	2	—	2	2	(1)	1
Foreign exchange and other	(27)	17	(10)	(26)	3	(23)	(52)	17	(35)
<b>Net change</b>	<b>846</b>	<b>(190)</b>	<b>656</b>	<b>(2,579)</b>	<b>610</b>	<b>(1,969)</b>	<b>20</b>	<b>(9)</b>	<b>11</b>
<b>DVA on fair value option elected liabilities, net change:</b>	<b>\$ (418)</b>	<b>\$ 99</b>	<b>\$ (319)</b>	<b>\$ 419</b>	<b>\$ (98)</b>	<b>\$ 321</b>	<b>\$ (86)</b>	<b>\$ 31</b>	<b>\$ (55)</b>
<b>Total other comprehensive income/(loss)</b>	<b>\$ 4,432</b>	<b>\$ (1,063)</b>	<b>\$ 3,369</b>	<b>\$(4,614)</b>	<b>\$ 1,020</b>	<b>\$(3,594)</b>	<b>\$ 1,297</b>	<b>\$ (787)</b>	<b>\$ 510</b>

- (a) The pre-tax amount is reported in investment securities gains/(losses) in the Consolidated statements of income.
- (b) Reclassifications of pre-tax realized gains/(losses) on translation adjustments and related hedges are reported in other income/expense in the Consolidated statements of income. During the year ended December 31, 2019, the Bank reclassified net pre-tax gains of \$6 million to other income. This amount, which related to the liquidation of certain legal entities, is comprised of \$4 million related to net investment hedge gains and \$2 million related to cumulative translation adjustments. During the year ended December 31, 2018, the Bank reclassified a net pre-tax loss of \$174 million to other expense related to the liquidation of certain legal entities, \$23 million related to net investment hedge losses and \$151 million related to cumulative translation adjustments. During the year ended December 31, 2017, the amount of such reclassifications were not material.
- (c) Represents changes in fair value of cross-currency swaps attributable to changes in cross-currency basis spreads, which are excluded from the assessment of hedge effectiveness and recorded in other comprehensive income. The initial cost of cross-currency basis spreads is recognized in earnings as part of the accrual of interest on the cross-currency swap.
- (d) The pre-tax amounts are primarily recorded in noninterest revenue, net interest income and compensation expense in the Consolidated statements of income.
- (e) The pre-tax amount is reported in other expense in the Consolidated statements of income.

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### Note 23 – Income taxes

The results of operations of the Bank 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 Bank its share of the consolidated income tax expense or benefit based upon statutory rates applied to the Bank's earnings as if it were filing separate income tax returns. Furthermore, JPMorgan Chase will reimburse the Bank for losses irrespective of whether the Bank would utilize losses on a separate return basis. The Bank uses the separate return adjusted for benefits-for-loss allocation methodology to provide income taxes on all transactions recorded in the Consolidated Financial Statements. Valuation allowances are established when necessary to reduce deferred tax assets to an amount that in the opinion of management, is more likely than not to be realized. State and local income taxes are provided on the Bank's taxable income at the effective income tax rate applicable to the consolidated JPMorgan Chase entity.

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

Due to the inherent complexities arising from the nature of the Bank's businesses, and from conducting business and being taxed in a substantial number of jurisdictions, significant judgments and estimates are required to be made. Agreement of tax liabilities between the Bank and the many tax jurisdictions in which the Bank files tax returns may not be finalized for several years. Thus, the Bank's final tax-related assets and liabilities may ultimately be different from those currently reported.

#### Effective tax rate and expense

The following table presents a reconciliation of the applicable statutory U.S. federal income tax rate to the effective tax rate.

#### Effective tax rate

Year ended December 31,	2019	2018	2017
Statutory U.S. federal tax rate	21.0%	21.0%	35.0%
Increase/(decrease) in tax rate resulting from:			
U.S. state and local income taxes, net of U.S. federal income tax benefit	3.2	4.0	2.0
Tax-exempt income	(1.1)	(1.2)	(2.8)
Non-U.S. earnings	1.7	0.7	(2.0) <sup>(a)</sup>
Business tax credits	(1.2)	(1.4)	(2.1)
Tax audit resolutions	(2.5)	–	(0.4)
Impact of the TCJA	–	(1.2)	9.2
Other, net	0.1	0.6	–
<b>Effective tax rate</b>	<b>21.2%</b>	<b>22.5%</b>	<b>38.9%</b>

(a) Predominantly includes earnings of U.K. subsidiaries that were deemed to be reinvested indefinitely through December 31, 2017.

### Impact of the TCJA

#### 2018

The Bank's effective tax rate decreased in 2018 due to the TCJA, including the reduction in the U.S. federal statutory income tax rate as well as a \$443 million net tax benefit recorded in 2018 resulting from changes in the estimates related to the remeasurement of certain deferred taxes and the deemed repatriation tax on non-U.S. earnings. The change in estimate was recorded under SEC Staff Accounting Bulletin No. 118 ("SAB 118") and the accounting under SAB 118 is complete.

#### 2017

The Bank's effective tax rate increased in 2017 driven by a \$2.9 billion income tax expense representing the estimated impact of the enactment of the TCJA. The \$2.9 billion tax expense was predominantly driven by a deemed repatriation of the Bank's unremitted non-U.S. earnings and adjustments to the value of certain tax-oriented investments partially offset by a benefit from the revaluation of the Bank's net deferred tax liability.

The deemed repatriation of the Bank's unremitted non-U.S. earnings is based on the post-1986 earnings and profits of each controlled foreign corporation. The calculation resulted in an estimated income tax expense of \$3.9 billion. Furthermore, accounting for income taxes requires the remeasurement of certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future. The Bank remeasured its deferred tax asset and liability balances in December of 2017 to the new statutory U.S. federal income tax rate of 21% as well as any federal benefit associated with state and local deferred income taxes. The remeasurement resulted in an estimated income tax benefit of \$1.4 billion.

Adjustments were also recorded in 2017 to income tax expense for certain tax-oriented investments. These adjustments were due to changes to affordable housing proportional amortization resulting from the reduction of the federal income tax rate under the TCJA. SAB 118 did not apply to these adjustments.

The following table reflects the components of income tax expense/(benefit) included in the Consolidated statements of income.

### Income tax expense/(benefit)

Year ended December 31, (in millions)	2019	2018	2017
<b>Current income tax expense/(benefit)</b>			
U.S. federal	\$ 4,121	\$ 3,481	\$ 9,611
Non-U.S.	1,844	1,785	2,151
U.S. state and local	1,434	1,559	818
<b>Total current income tax expense/ (benefit)</b>	<b>7,399</b>	<b>6,825</b>	<b>12,580</b>
<b>Deferred income tax expense/(benefit)</b>			
U.S. federal	789	1,316	32
Non-U.S.	14	(102)	(146)
U.S. state and local	218	386	62
<b>Total deferred income tax expense/ (benefit)</b>	<b>1,021</b>	<b>1,600</b>	<b>(52)</b>
<b>Total income tax expense</b>	<b>\$ 8,420</b>	<b>\$ 8,425</b>	<b>\$ 12,528</b>

Total income tax expense includes \$1.1 billion, \$11 million and \$199 million of tax benefits recorded in 2019, 2018 and 2017, respectively, as a result of tax audit resolutions.

#### Tax effect of items recorded in Stockholder's equity

The preceding table does not reflect the tax effect of certain items that are recorded each period directly in stockholder's equity. The tax effect of all items recorded directly to stockholder's equity resulted in a decrease of \$1.1 billion in 2019 and an increase of \$902 million in 2018, and a decrease of \$785 million in 2017.

### Results from Non-U.S. earnings

The following table presents the U.S. and non-U.S. components of income before income tax expense.

Year ended December 31, (in millions)	2019	2018	2017
U.S.	\$ 32,766	\$ 30,380	\$ 24,800
Non-U.S. <sup>(a)</sup>	6,993	6,998	7,368
<b>Income before income tax expense</b>	<b>\$ 39,759</b>	<b>\$ 37,378</b>	<b>\$ 32,168</b>

(a) For purposes of this table, non-U.S. income is defined as income generated from operations located outside the U.S.

Prior to December 31, 2017, U.S. federal income taxes had not been provided on the undistributed earnings of certain non-U.S. subsidiaries, to the extent that such earnings had been reinvested abroad for an indefinite period of time. The Bank is no longer maintaining the indefinite reinvestment assertion on the undistributed earnings of those non-U.S. subsidiaries in light of the enactment of the TCJA. The U.S. federal and state and local income taxes associated with the undistributed and previously untaxed earnings of those non-U.S. subsidiaries was included in the deemed repatriation charge recorded as of December 31, 2017. The Bank will recognize any taxes it may incur on global intangible low tax income as income tax expense in the period in which the tax is incurred.

### Affordable housing tax credits

The Bank recognized \$1.5 billion and \$1.5 billion and \$1.7 billion of tax credits and other tax benefits associated with investments in affordable housing projects within income tax expense for the years 2019, 2018 and 2017, respectively. The amount of amortization of such investments reported in income tax expense was \$1.1 billion, \$1.2 billion and \$1.6 billion, respectively. The carrying value of these investments, which are reported in other assets on the Bank's Consolidated balance sheets, was \$8.6 billion and \$7.8 billion at December 31, 2019 and 2018, respectively. The amount of commitments related to these investments, which are reported in accounts payable and other liabilities on the Bank's Consolidated balance sheets, was \$2.8 billion and \$2.3 billion at December 31, 2019 and 2018, respectively.

### Deferred taxes

Deferred income tax expense/(benefit) results from differences between assets and liabilities measured for financial reporting purposes versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. If a deferred tax asset is determined to be unrealizable, a valuation allowance is established. The significant components of deferred tax assets and liabilities are reflected in the following table.

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December 31, (in millions)	2019	2018
<b>Deferred tax assets</b>		
Allowance for loan losses	\$ 3,390	\$ 3,422
Employee benefits	–	98
Accrued expenses and other	2,223	2,238
Non-U.S. operations	766	528
Tax attribute carryforwards	308	52
<b>Gross deferred tax assets</b>	<b>6,687</b>	<b>6,338</b>
Valuation allowance	(330)	(47)
<b>Deferred tax assets, net of valuation allowance</b>	<b>\$ 6,357</b>	<b>\$ 6,291</b>
<b>Deferred tax liabilities</b>		
Depreciation and amortization	\$ 1,877	\$ 1,589
Mortgage servicing rights, net of hedges	2,354	2,586
Leasing transactions	5,543	4,615
Other, net	3,013	1,966
<b>Gross deferred tax liabilities</b>	<b>12,787</b>	<b>10,756</b>
<b>Net deferred tax (liabilities)/assets</b>	<b>\$ (6,430)</b>	<b>\$ (4,465)</b>

The Bank has recorded deferred tax assets of \$308 million at December 31, 2019, in connection with U.S. federal and non-U.S. net operating loss (“NOL”) carryforwards and foreign tax credit (“FTC”) carryforwards. At December 31, 2019, total U.S. federal NOL carryforwards were approximately \$129 million and non-U.S. NOL carryforwards were approximately \$61 million, and FTC carryforwards were \$257 million. If not utilized, a portion of the the U.S. federal NOL carryforwards will expire between 2030 and 2036 whereas others have an unlimited carryforward period. Similarly, certain non-U.S. NOL carryforwards will expire between 2029 and 2037 whereas others have an unlimited carryforward period. The FTC carryforwards will expire in 2029.

The valuation allowance at December 31, 2019, was due to FTC carryforwards and certain non-U.S. deferred tax assets, including NOL carryforwards.

### Unrecognized tax benefits

At December 31, 2019, 2018 and 2017, the Bank’s unrecognized tax benefits, excluding related interest expense and penalties, were \$2.8 billion, \$3.6 billion and \$3.6 billion, respectively, of which \$1.9 billion, \$2.9 billion and \$2.7 billion, respectively, if recognized, would reduce the annual effective tax rate. Included in the amount of unrecognized tax benefits are certain items that would not affect the effective tax rate if they were recognized in the Consolidated statements of income. These unrecognized items include the tax effect of certain temporary differences, the portion of gross state and local unrecognized tax benefits that would be offset by the benefit from associated U.S. federal income tax deductions, and the portion of gross non-U.S. unrecognized tax benefits that would have offsets in other jurisdictions. JPMorgan Chase is presently under audit by a number of taxing

authorities, most notably by the Internal Revenue Service as summarized in the Tax examination status table below.

As the Bank is presently under audit by a number of taxing authorities, it is reasonably possible that over the next 12 months the resolution of these examinations may increase or decrease the gross balance of unrecognized tax benefits by as much as \$0.5 billion. Upon settlement of an audit, the change in the unrecognized tax benefit would result from payment or income statement recognition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits.

Year ended December 31, (in millions)	2019	2018	2017
Balance at January 1,	\$ 3,645	\$ 3,562	\$ 2,736
Increases based on tax positions related to the current period	541	659	865
Increases based on tax positions related to prior periods	77	564	494
Decreases based on tax positions related to prior periods	(426)	(880)	(206)
Decreases related to cash settlements with taxing authorities	(1,076)	(260)	(327)
<b>Balance at December 31,</b>	<b>\$ 2,761</b>	<b>\$ 3,645</b>	<b>\$ 3,562</b>

After-tax interest expense/(benefit) and penalties related to income tax liabilities recognized in income tax expense were \$(100) million, \$148 million and \$83 million in 2019, 2018 and 2017, respectively.

At December 31, 2019 and 2018, in addition to the liability for unrecognized tax benefits, the Bank had accrued \$539 million and \$668 million, respectively, for income tax-related interest and penalties.

### Tax examination status

The Bank is continually under examination by the Internal Revenue Service, by taxing authorities throughout the world, and by many state and local jurisdictions throughout the U.S. The following table summarizes the status of significant income tax examinations of the Bank and its consolidated subsidiaries as of December 31, 2019.

	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
JPMorgan Chase – U.K.	2006 – 2017	Field examination of certain select entities

## Note 24 – Restricted cash, other restricted assets and intercompany funds transfers

### Restricted cash and other restricted assets

Certain of the Bank's cash and other assets are restricted as to withdrawal or usage. These restrictions are imposed by various regulatory authorities based on the particular activities of the Bank.

The business of the Bank is subject to examination and regulation by the OCC. The Bank is a member of the U.S. Federal Reserve System, and its deposits in the U.S. are insured by the FDIC, subject to applicable limits.

The Federal Reserve requires depository institutions to maintain cash reserves with a Federal Reserve Bank. The average required amount of reserve balances is deposited by the Bank. In addition, the Bank is required to maintain cash reserves at certain non-US central banks.

The Bank is also subject to rules and regulations established by other U.S. and non U.S. regulators. As part of its compliance with the respective regulatory requirements, the Bank's broker-dealer J.P. Morgan Securities plc in the U.K. is subject to certain restrictions on cash and other assets.

The following table presents the components of the Bank's restricted cash:

December 31, (in billions)	2019	2018
Cash reserves - Federal Reserve Banks	\$ 26.6	\$ 22.1
Segregated for the benefit of securities and cleared derivative customers	7.6	7.1
Cash reserves at non-U.S. central banks and held for other general purposes	3.9	4.1
<b>Total restricted cash<sup>(a)</sup></b>	<b>\$ 38.1</b>	<b>\$ 33.3</b>

(a) Comprises \$36.8 billion and \$32.1 billion in deposits with banks, and \$1.3 billion and \$1.2 billion in cash and due from banks on the Consolidated balance sheets as of December 31, 2019 and 2018, respectively.

Also, as of December 31, 2019 and 2018, the Bank had cash pledged with clearing organizations for the benefit of customers of \$4.4 billion and \$4.8 billion, respectively.

### Intercompany funds transfers

Restrictions imposed by U.S. federal law prohibit JPMorgan Chase & Co. and certain of its affiliates from borrowing from the Bank and other banking subsidiaries unless the loans are secured in specified amounts. Such secured loans provided by the Bank to any particular affiliate, together with certain other transactions with such affiliate (collectively referred to as "covered transactions"), are generally limited to 10% of the Bank's total capital, as determined by the risk-based capital guidelines; the aggregate amount of covered transactions between the Bank and all affiliates is limited to 20% of the Bank's total capital.

In addition to dividend restrictions set forth in statutes and regulations, the OCC, and under certain circumstances the FDIC, have authority under the Financial Institutions Supervisory Act to prohibit or to limit the payment of dividends by the banking organizations they supervise, including the Bank if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization.

At January 1, 2020, the Bank could pay, in the aggregate, approximately \$9 billion in dividends to JPMorgan Chase without the prior approval of its relevant banking regulators. The capacity to pay dividends in 2020 will be supplemented by the Bank's earnings during the year.

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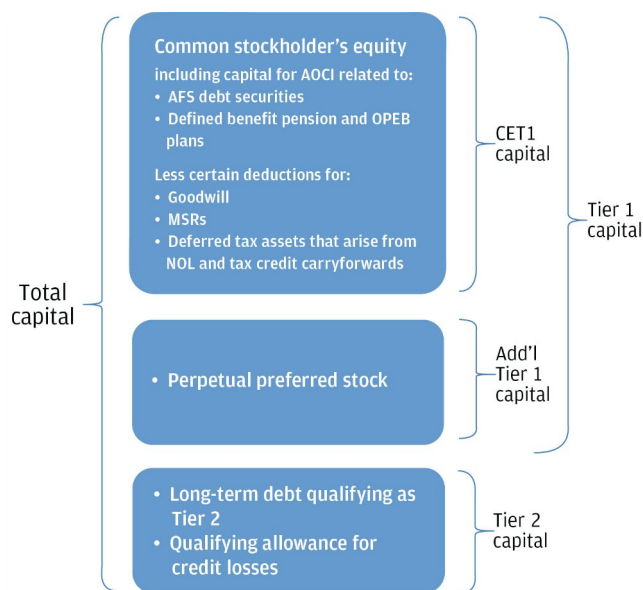
### Note 25 – Regulatory capital

The Bank's banking regulator, the OCC, establishes capital requirements, including well-capitalized standards for national banks.

#### Basel III overview

The capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for banks, including JPMorgan Chase Bank, N.A. Two comprehensive approaches are prescribed for calculating risk-weighted assets ("RWA"): a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). Effective January 1, 2019, the capital adequacy of the Bank is evaluated against the fully phased-in measures under Basel III that represents the lower of the Standardized or Advanced approaches. During 2018, the required capital measures were subject to the transitional rules and as of December 31, 2018 were the same on a fully phased-in and on a transitional basis.

The three components of regulatory capital under the Basel III rules are as illustrated below:



#### Risk-weighted assets

Basel III establishes capital requirements for calculating credit risk RWA and market risk RWA, and in the case of Basel III Advanced, operational risk RWA. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent

basis between Basel III Standardized and Basel III Advanced. In addition to the RWA calculated under these approaches, the Bank may supplement such amounts to incorporate management judgment and feedback from its bank regulators.

#### Supplementary leverage ratio ("SLR")

Basel III also includes a requirement for Advanced Approach banking organizations to calculate the SLR. The SLR is defined as Tier 1 capital under Basel III divided by the Bank's total leverage exposure. Total leverage exposure is calculated by taking the Bank's total average on-balance sheet assets, less amounts permitted to be deducted for Tier 1 capital, and adding certain off-balance sheet exposures, such as undrawn commitments and derivatives potential future exposure.

#### Risk-based capital regulatory minimums

The Bank is subject to Basel III capital rules which include minimum capital ratio requirements that were subject to phase-in periods ("transitional period") through the end of 2018. While the required capital remained subject to the transitional rules during 2018, the Bank's capital ratios as of December 31, 2018 were equivalent whether calculated on a transitional or fully phased-in basis.

The Bank is required to hold additional amounts of capital to serve as a "capital conservation buffer". The capital conservation buffer is intended to be used to absorb losses in times of financial or economic stress. The capital conservation buffer was subject to a phase-in period that began January 1, 2016 and continued through the end of 2018. Effective January 1, 2019, the Bank is required to hold a 2.5% capital conservation buffer.

As an expansion of the capital conservation buffer, the Bank is also required to hold additional levels of capital in the form of a countercyclical capital buffer. The Federal Reserve's framework for setting the countercyclical capital buffer takes into account the macro financial environment in which large, internationally active banks function. As of December 31, 2019, the U.S. countercyclical capital buffer remained at 0%. The Federal Reserve will continue to review the buffer at least annually. The buffer can be increased if the Federal Reserve, FDIC and OCC determine that systemic risks are meaningfully above normal and can be calibrated up to an additional 2.5% of RWA subject to a 12-month implementation period.

Failure to maintain regulatory capital equal to or in excess of the risk-based regulatory capital minimum plus the capital conservation buffer and any countercyclical buffer may result in limitations to the amount of capital that the Bank may distribute.

Under the risk-based capital and leverage-based guidelines of the OCC, the Bank is required to maintain minimum ratios for CET1, Tier 1, Total, Tier 1 leverage and the SLR. Failure

to meet these minimum requirements could cause the OCC to take action.

The following table presents the minimum and well-capitalized ratios to which the Bank was subject as of December 31, 2019.

	Minimum capital ratios <sup>(a)(b)(c)</sup>	Well-capitalized ratios <sup>(d)</sup>
<b>Capital ratios</b>		
CET1	7.0%	6.5%
Tier 1	8.5	8.0
Total	10.5	10.0
Tier 1 leverage	4.0	5.0
SLR	6.0	6.0

Note: The table above is as defined by the regulations issued by the OCC and FDIC and to which the Bank is subject.

- (a) Represents requirements for the Bank. The CET1 minimum capital ratio includes a capital conservation buffer of 2.5%.
- (b) For the period ended December 31, 2018, the CET1, Tier 1, Total and Tier 1 leverage minimum capital ratios applicable to the Bank were 6.375%, 7.875%, 9.875% and 4.0%, respectively.
- (c) Represents minimum SLR requirement of 3.0%, as well as, supplementary leverage buffer of 3.0% for the Bank.
- (d) Represents requirements for the Bank pursuant to regulations issued under the FDIC Improvement Act.

The following tables present the risk-based and leverage-based capital metrics for the Bank under both the Basel III Standardized and Basel III Advanced Approaches. As of December 31, 2019 and 2018, the Bank was well-capitalized and met all capital requirements to which it was subject.

	Basel III Standardized		Basel III Advanced	
	Fully Phased-in	Transitional	Fully Phased-in	Transitional
	(in millions, except ratios) Dec 31, 2019	Dec 31, 2018	Dec 31, 2019	Dec 31, 2018
<b>Regulatory capital</b>				
CET1 capital	\$ 206,848	\$ 211,671	\$ 206,848	\$ 211,671
Tier 1 capital	206,851	211,671	206,851	211,671
Total capital	224,390	229,952	214,091	220,025
<b>Assets</b>				
Risk-weighted	1,457,689	1,446,529	1,269,991	1,283,146
Adjusted average <sup>(a)</sup>	2,353,432	2,250,480	2,353,432	2,250,480
<b>Capital ratios<sup>(b)</sup></b>				
CET1	14.2%	14.6%	16.3%	16.5%
Tier 1	14.2	14.6	16.3	16.5
Total	15.4	15.9	16.9	17.1
Tier 1 leverage <sup>(c)</sup>	8.8	9.4	8.8	9.4

- (a) Adjusted average assets, for purposes of calculating the Tier 1 leverage ratio, includes total quarterly average assets adjusted for on-balance

sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets.

- (b) For each of the risk-based capital ratios, the capital adequacy of the Bank is evaluated against the lower of the two ratios as calculated under Basel III approaches (Standardized or Advanced).
- (c) The Tier 1 leverage ratio is not a risk-based measure of capital.

	December 31, 2019	December 31, 2018
(in millions, except ratios)	<b>Basel III Advanced Fully Phased-in</b>	<b>Basel III Advanced Fully Phased-in</b>
Total leverage exposure	\$ 3,044,509	\$ 2,915,541
SLR	6.8%	7.3%

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### Note 26 – Off-balance sheet lending-related financial instruments, guarantees, and other commitments

The Bank provides lending-related financial instruments (e.g., commitments and guarantees) to address the financing needs of its customers and clients. The contractual amount of these financial instruments represents the maximum possible credit risk to the Bank should the customer or client draw upon the commitment or the Bank be required to fulfill its obligation under the guarantee, and should the customer or client subsequently fail to perform according to the terms of the contract. Most of these commitments and guarantees are refinanced, extended, cancelled, or expire without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Bank's view, representative of its expected future credit exposure or funding requirements.

To provide for probable credit losses inherent in wholesale and certain consumer lending-commitments, an allowance for credit losses on lending-related commitments is maintained. Refer to Note 14 for further information regarding the allowance for credit losses on lending-related commitments. The following table summarizes the contractual amounts and carrying values of off-balance sheet lending-related financial instruments, guarantees and other commitments at December 31, 2019 and 2018. The amounts in the table below for credit card and home equity lending-related commitments represent the total available credit for these products. The Bank has not experienced, and does not anticipate, that all available lines of credit for these products will be utilized at the same time. The Bank can reduce or cancel credit card lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. In addition, the Bank typically closes credit card lines when the borrower is 60 days or more past due. The Bank may reduce or close HELOCs when there are significant decreases in the value of the underlying property, or when there has been a demonstrable decline in the creditworthiness of the borrower.

## Off-balance sheet lending-related financial instruments, guarantees and other commitments

By remaining maturity at December 31, (in millions)	Contractual amount						Carrying value <sup>(h)</sup>	
	2019					2018	2019	2018
	Expires in 1 year or less	Expires after 1 year through 3 years	Expires after 3 years through 5 years	Expires after 5 years	Total	Total		
<b>Lending-related</b>								
Consumer, excluding credit card:								
Home equity	\$ 680	\$ 1,187	\$ 2,548	\$ 16,704	\$ 21,119	\$ 20,901	\$ 12	\$ 12
Residential mortgage <sup>(a)</sup>	9,086	—	—	12	9,098	5,481	—	—
Auto	8,296	600	197	195	9,288	8,011	2	2
Consumer & business banking	9,994	646	105	1,162	11,907	11,673	19	19
<b>Total consumer, excluding credit card</b>	<b>28,056</b>	<b>2,433</b>	<b>2,850</b>	<b>18,073</b>	<b>51,412</b>	<b>46,066</b>	<b>33</b>	<b>33</b>
Credit card	650,720	—	—	—	650,720	605,379	—	—
<b>Total consumer<sup>(b)</sup></b>	<b>678,776</b>	<b>2,433</b>	<b>2,850</b>	<b>18,073</b>	<b>702,132</b>	<b>651,445</b>	<b>33</b>	<b>33</b>
Wholesale:								
Other unfunded commitments to extend credit <sup>(c)</sup>	57,383	129,413	168,136	10,791	365,723	350,401	937	851
Standby letters of credit and other financial guarantees <sup>(c)(d)</sup>	15,919	11,126	5,117	1,745	33,907	33,513	618	521
Other letters of credit <sup>(c)</sup>	2,734	183	40	—	2,957	2,825	4	3
<b>Total wholesale<sup>(b)</sup></b>	<b>76,036</b>	<b>140,722</b>	<b>173,293</b>	<b>12,536</b>	<b>402,587</b>	<b>386,739</b>	<b>1,559</b>	<b>1,375</b>
<b>Total lending-related</b>	<b>\$ 754,812</b>	<b>\$ 143,155</b>	<b>\$ 176,143</b>	<b>\$ 30,609</b>	<b>\$ 1,104,719</b>	<b>\$ 1,038,184</b>	<b>\$ 1,592</b>	<b>\$ 1,408</b>
<b>Other guarantees and commitments</b>								
Securities lending indemnification agreements and guarantees <sup>(e)</sup>	\$ 222,601	\$ —	\$ —	\$ —	\$ 222,601	\$ 193,065	\$ —	\$ —
Derivatives qualifying as guarantees	1,924	221	11,299	40,242	53,686	55,641	164	399
Unsettled resale and securities borrowed agreements	74,394	400	—	—	74,794	87,700	—	—
Unsettled repurchase and securities loaned agreements	57,062	561	—	—	57,623	44,422	—	—
Loan sale and securitization-related indemnifications:								
Mortgage repurchase liability	NA	NA	NA	NA	NA	NA	59	89
Loans sold with recourse	NA	NA	NA	NA	647	671	11	7
Exchange & clearing house guarantees and commitments <sup>(f)</sup>	101,157	—	—	—	101,157	38,651	—	—
Other guarantees and commitments <sup>(g)</sup>	1,742	567	199	2,325	4,833	7,045	(75)	(78)

(a) Includes certain commitments to purchase loans from correspondents.

(b) Predominantly all consumer and wholesale lending-related commitments are in the U.S.

(c) At December 31, 2019 and 2018, reflected the contractual amount net of risk participations totaling \$76 million and \$282 million, respectively, for other unfunded commitments to extend credit; \$9.8 billion and \$10.4 billion, respectively, for standby letters of credit and other financial guarantees; and \$546 million and \$385 million, respectively, for other letters of credit. In regulatory filings with the Federal Reserve these commitments are shown gross of risk participations.

(d) At December 31, 2019 and 2018, included commitments to affiliates of zero and \$15 million, respectively.

(e) At December 31, 2019 and 2018, collateral held by the Bank in support of securities lending indemnification agreements was \$234.4 billion and \$202.7 billion, respectively. Securities lending collateral primarily consists of cash, G7 government securities, and securities issued by U.S. GSEs and government agencies.

(f) At December 31, 2019 and 2018, includes guarantees to the Fixed Income Clearing Corporation under the sponsored member repo program and commitments and guarantees associated with the Bank's membership in certain clearing houses.

(g) At December 31, 2019 and 2018, included unfunded equity investment commitments of \$48 million and \$15 million, respectively. In addition, at both December 31, 2019 and 2018, included letters of credit hedged by derivative transactions and managed on a market risk basis of \$2.3 billion and \$3.2 billion.

(h) For lending-related products, the carrying value represents the allowance for lending-related commitments and the guarantee liability; for derivative-related products, the carrying value represents the fair value.

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### Other unfunded commitments to extend credit

Other unfunded commitments to extend credit generally consist of commitments for working capital and general corporate purposes, extensions of credit to support commercial paper facilities and bond financings in the event that those obligations cannot be remarketed to new investors, as well as committed liquidity facilities to clearing organizations. The Bank also issues commitments under multipurpose facilities which could be drawn upon in several forms, including the issuance of a standby letter of credit.

### Guarantees

U.S. GAAP requires that a guarantor recognize, at the inception of a guarantee, a liability in an amount equal to the fair value of the obligation undertaken in issuing the guarantee. U.S. GAAP defines a guarantee as a contract that contingently requires the guarantor to pay a guaranteed party based upon: (a) changes in an underlying asset, liability or equity security of the guaranteed party; or (b) a third party's failure to perform under a specified agreement. The Bank considers the following off-balance sheet arrangements to be guarantees under U.S. GAAP: standby letters of credit and other financial guarantees, securities lending indemnifications, certain indemnification agreements included within third-party contractual arrangements, certain derivative contracts and the guarantees under the sponsored member repo program.

As required by U.S. GAAP, the Bank initially records guarantees at the inception date fair value of the obligation assumed (e.g., the amount of consideration received or the net present value of the premium receivable). For certain types of guarantees,

The Bank records this fair value amount in other liabilities with an offsetting entry recorded in cash (for premiums received), or other assets (for premiums receivable). Any premium receivable recorded in other assets is reduced as cash is received under the contract, and the fair value of the liability recorded at inception is amortized into income as lending and deposit-related fees over the life of the guarantee contract. For indemnifications provided in sales agreements, a portion of the sale proceeds is allocated to the guarantee, which adjusts the gain or loss that would otherwise result from the transaction. For these indemnifications, the initial liability is amortized to income as the Bank's risk is reduced (i.e., over time or when the indemnification expires). Any contingent liability that exists as a result of issuing the guarantee or indemnification is recognized when it becomes probable and reasonably estimable. The contingent portion of the liability is not recognized if the estimated amount is less than the carrying amount of the liability recognized at inception (adjusted for any amortization). The contractual amount and carrying value of guarantees and indemnifications are included in the table on page 119. For additional information on the guarantees, see below.

### Standby letters of credit and other financial guarantees

Standby letters of credit and other financial guarantees are conditional lending commitments issued by the Bank to guarantee the performance of a client or customer to a third party under certain arrangements, such as commercial paper facilities, bond financings, acquisition financings, trade and similar transactions.

The following table summarizes the contractual amount and carrying value of standby letters of credit and other financial guarantees and other letters of credit arrangements as of December 31, 2019 and 2018.

### Standby letters of credit, other financial guarantees and other letters of credit

December 31, (in millions)	2019		2018	
	Standby letters of credit and other financial guarantees	Other letters of credit	Standby letters of credit and other financial guarantees	Other letters of credit
Investment-grade <sup>(a)</sup>	\$ 26,646	\$ 2,136	\$ 26,420	\$ 2,079
Noninvestment-grade <sup>(a)</sup>	7,261	821	7,093	746
<b>Total contractual amount</b>	<b>\$ 33,907</b>	<b>\$ 2,957</b>	<b>\$ 33,513</b>	<b>\$ 2,825</b>
Allowance for lending-related commitments	\$ 216	\$ 4	\$ 167	\$ 3
Guarantee liability	402	—	354	—
<b>Total carrying value</b>	<b>\$ 618</b>	<b>\$ 4</b>	<b>\$ 521</b>	<b>\$ 3</b>
<b>Commitments with collateral</b>	<b>\$ 17,582</b>	<b>\$ 726</b>	<b>\$ 17,400</b>	<b>\$ 583</b>

(a) The ratings scale is based on the Bank's internal risk ratings. Refer to Note 13 for further information on internal risk ratings.

### Securities lending indemnifications

Through the Bank's securities lending program, counterparties' securities, via custodial and non-custodial arrangements, may be lent to third parties. As part of this program, the Bank provides an indemnification in the lending agreements which protects the lender against the failure of the borrower to return the lent securities. To minimize its liability under these indemnification agreements, the Bank obtains cash or other highly liquid collateral with a market value exceeding 100% of the value of the securities on loan from the borrower. Collateral is marked to market daily to help assure that collateralization is adequate. Additional collateral is called from the borrower if a shortfall exists, or collateral may be released to the borrower in the event of overcollateralization. If a borrower defaults, the Bank would use the collateral held to purchase replacement securities in the market or to credit the lending client or counterparty with the cash equivalent thereof.

The cash collateral held by the Bank may be invested on behalf of the client in indemnified resale agreements, whereby the Bank indemnifies the client against the loss of principal invested. To minimize its liability under these agreements, the Bank obtains collateral with a market value exceeding 100% of the principal invested.

### Derivatives qualifying as guarantees

The Bank transacts in certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. These contracts include written put options that require the Bank to purchase assets upon exercise by the option holder at a specified price by a specified date in the future. The Bank may enter into written put option contracts in order to meet client needs, or for other trading purposes. The terms of written put options are typically five years or less.

Derivatives deemed to be guarantees also includes stable value contracts, commonly referred to as "stable value products", that require the Bank to make a payment of the difference between the market value and the book value of a counterparty's reference portfolio of assets in the event that market value is less than book value and certain other conditions have been met. Stable value products are transacted in order to allow investors to realize investment returns with less volatility than an unprotected portfolio. These contracts are typically longer-term or may have no stated maturity, but allow the Bank to elect to terminate the contract under certain conditions.

The notional value of derivatives guarantees generally represents the Bank's maximum exposure. However, exposure to certain stable value products is contractually limited to a substantially lower percentage of the notional amount.

The fair value of derivative guarantees reflects the probability, in the Bank's view, of whether the Bank will be required to perform under the contract. The Bank reduces exposures to these contracts by entering into offsetting

transactions, or by entering into contracts that hedge the market risk related to the derivative guarantees.

The following table summarizes the derivatives qualifying as guarantees as of December 31, 2019 and 2018.

(in millions)	December 31, 2019	December 31, 2018
<b>Notional amounts</b>		
Derivative guarantees	\$ 53,686	\$ 55,641
Stable value contracts with contractually limited exposure	28,877	28,637
Maximum exposure of stable value contracts with contractually limited exposure	2,967	2,963
<b>Fair value</b>		
Derivative payables	164	399

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

### Unsettled securities financing agreements

In the normal course of business, the Bank enters into resale and securities borrowed agreements. At settlement, these commitments result in the Bank advancing cash to and receiving securities collateral from the counterparty. The Bank also enters into repurchase and securities loaned agreements. At settlement, these commitments result in the Bank receiving cash from and providing securities collateral to the counterparty. Such agreements settle at a future date. These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated balance sheets until settlement date. These agreements predominantly have regular-way settlement terms. Refer to Note 12 for a further discussion of securities financing agreements.

### Loan sales- and securitization-related indemnifications

#### Mortgage repurchase liability

In connection with the Bank's mortgage loan sale and securitization activities with U.S. GSEs the Bank has made representations and warranties that the loans sold meet certain requirements, and that may require the Bank to repurchase mortgage loans and/or indemnify the loan purchaser if such representations and warranties are breached by the Bank. Further, although the Bank's securitizations are predominantly nonrecourse, the Bank does provide recourse servicing in certain limited cases where it agrees to share credit risk with the owner of the mortgage loans. To the extent that repurchase demands that are received relate to loans that the Bank purchased from third parties that remain viable, the Bank typically will have the right to seek a recovery of related repurchase losses from the third party. Generally, the maximum amount of future payments the Bank would be required to make for breaches of these representations and warranties would be equal to the unpaid principal balance of such loans that are deemed to have defects that were sold to purchasers (including securitization-related SPEs) plus, in certain

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circumstances, accrued interest on such loans and certain expenses.

### *Private label securitizations*

The liability related to repurchase demands associated with private label securitizations is separately evaluated by the Bank in establishing its litigation reserves.

Refer to Note 28 for additional information regarding litigation.

### *Loans sold with recourse*

The Bank provides servicing for mortgages and certain commercial lending products on both a recourse and nonrecourse basis. In nonrecourse servicing, the principal credit risk to the Bank is the cost of temporary servicing advances of funds (i.e., normal servicing advances). In recourse servicing, the servicer agrees to share credit risk with the owner of the mortgage loans, such as Fannie Mae or Freddie Mac or a private investor, insurer or guarantor. Losses on recourse servicing predominantly occur when foreclosure sales proceeds of the property underlying a defaulted loan are less than the sum of the outstanding principal balance, plus accrued interest on the loan and the cost of holding and disposing of the underlying property. The Bank's securitizations are predominantly nonrecourse, thereby effectively transferring the risk of future credit losses to the purchaser of the mortgage-backed securities issued by the trust. At December 31, 2019 and 2018, the unpaid principal balance of loans sold with recourse totaled \$647 million and \$671 million, respectively. The carrying value of the related liability that the Bank has recorded in accounts payable and other liabilities on the Consolidated balance sheets, which is representative of the Bank's view of the likelihood it will have to perform under its recourse obligations, was \$11 million and \$7 million at December 31, 2019 and 2018, respectively.

## **Other off-balance sheet arrangements**

### *Indemnification agreements - general*

In connection with issuing securities to investors outside the U.S., the Bank may agree to pay additional amounts to the holders of the securities in the event that, due to a change in tax law, certain types of withholding taxes are imposed on payments on the securities. The terms of the securities may also give the Bank the right to redeem the securities if such additional amounts are payable. The Bank may also enter into indemnification clauses in connection with the licensing of software to clients ("software licensees") or when it sells a business or assets to a third party ("third-party purchasers"), pursuant to which it indemnifies software licensees for claims of liability or damages that may occur subsequent to the licensing of the software, or third-party purchasers for losses they may incur due to actions taken by the Bank prior to the sale of the business or assets. It is difficult to estimate the Bank's maximum exposure under these indemnification arrangements, since this would require an assessment of future changes in tax

law and future claims that may be made against the Bank that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

### *Merchant charge-backs*

Under the rules of payment networks, the Bank, in its role as a merchant acquirer, retains a contingent liability for disputed processed credit and debit card transactions that result in a charge-back to the merchant. If a dispute is resolved in the cardholder's favor, the Bank will (through the cardholder's issuing bank) credit or refund the amount to the cardholder and will charge back the transaction to the merchant. If the Bank is unable to collect the amount from the merchant, the Bank will bear the loss for the amount credited or refunded to the cardholder. The Bank mitigates this risk by withholding future settlements, retaining cash reserve accounts or obtaining other collateral. In addition, the Bank recognizes a valuation allowance that covers the payment or performance risk to the Bank related to charge-backs.

For the years ended December 31, 2019, 2018 and 2017, the Bank processed an aggregate volume of \$1,511.5 billion, \$1,366.1 billion, and \$1,191.7 billion, respectively, and the related losses from merchant charge-backs were not material.

### *Clearing Services - Client Credit Risk*

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

The Bank reflects its exposure to nonperformance risk of the client through the recognition of margin receivables from clients and margin payables to CCPs; the clients' underlying securities or derivative contracts are not reflected in the Bank's Consolidated Financial Statements.

It is difficult to estimate the Bank's maximum possible exposure through its role as a clearing member, as this would require an assessment of transactions that clients may execute in the future. However, based upon historical experience, and the credit risk mitigants available to the Bank, management believes it is unlikely that the Bank 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 Bank executes for its own account and records in its Consolidated Financial Statements.

#### *Exchange & Clearing House Memberships*

The Bank 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 Bank to pay a pro rata share of the losses incurred by the organization as a result of the default of another member. Such obligations vary with different organizations. These obligations may be limited to the amount (or a multiple of the amount) of the Bank'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 Bank 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 Bank's maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against the Bank that have not yet occurred. However, based on historical experience, management expects the risk of loss to the Bank to be remote. Where the Bank's maximum possible exposure can be estimated, the amount is disclosed in the table on page 119, in the Exchange & clearing house guarantees and commitments line.

#### *Sponsored member repo program*

In 2018 the Bank commenced the sponsored member repo program, wherein the Bank 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 Bank 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 Bank 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 Bank expects the risk of loss to be remote. The Bank's maximum possible exposure, without taking into consideration the associated collateral, is included in the Exchange & clearing house guarantees and commitments line on page 119. Refer to Note 12 for additional information on credit risk mitigation practices on resale agreements and the types of collateral pledged under repurchase agreements.

#### *Guarantees of subsidiaries and affiliates*

In the normal course of business, the Bank may provide counterparties with guarantees of certain of the trading and other obligations of its subsidiaries and affiliates on a contract-by-contract basis, as negotiated with the Bank's counterparties. The obligations of the subsidiaries are included on the Bank's Consolidated balance sheets or are reflected as off-balance sheet commitments; therefore, the Bank has not recognized a separate liability for these guarantees. As at December 31, 2019 and 2018, guarantees of obligations of affiliates provided by the Bank were not material. The Bank believes that the occurrence of any event that would trigger payments under these guarantees is remote.

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### Note 27 – Pledged assets and collateral

#### Pledged assets

The Bank pledges financial assets that it owns to maintain potential borrowing capacity at discount windows with Federal Reserve banks, various other central banks and FHLBs. Additionally, the Bank pledges assets for other purposes, including to collateralize repurchase and other securities financing agreements, to cover short sales and to collateralize derivative contracts and deposits and borrowings of affiliates. Certain of these pledged assets may be sold or repledged or otherwise used by the secured parties and are parenthetically identified on the Consolidated balance sheets as assets pledged.

The following table presents the Bank's pledged assets.

December 31, (in billions)	2019	2018
Assets that may be sold or repledged or otherwise used by secured parties	\$ 69.7	\$ 63.5
Assets that may not be sold or repledged or otherwise used by secured parties	37.7	39.3
Assets pledged at Federal Reserve banks and FHLBs	478.9	475.4
<b>Total pledged assets</b>	<b>\$ 586.3</b>	<b>\$ 578.2</b>

Total pledged assets do not include assets of consolidated VIEs; these assets are used to settle the liabilities of those entities. Refer to Note 15 for additional information on assets and liabilities of consolidated VIEs. Refer to Note 12 for additional information on the Bank's securities financing activities. Refer to Note 20 for additional information on the Bank's long-term debt. The significant components of the Bank's pledged assets were as follows.

December 31, (in billions)	2019	2018
Investment securities	\$ 41.7	\$ 65.9
Loans	460.3	439.9
Trading assets and other	84.3	72.4
<b>Total pledged assets</b>	<b>\$ 586.3</b>	<b>\$ 578.2</b>

#### Collateral

The Bank accepts financial assets as collateral that it is permitted to sell or repledge, deliver or otherwise use. This collateral is generally obtained under resale and other securities financing agreements, prime brokerage-related held-for-investment customer receivables and derivative contracts. Collateral is generally used under repurchase and other securities financing agreements, to cover short sales, and to collateralize derivative contracts and deposits.

The following table presents the fair value of collateral accepted.

December 31, (in billions)	2019	2018
Collateral permitted to be sold or repledged, delivered, or otherwise used	\$ 670.7	\$ 880.0
Collateral sold, repledged, delivered or otherwise used	532.3	714.6

## Note 28 - Litigation

### Contingencies

As of December 31, 2019, JPMorgan Chase and its subsidiaries, including but not limited to JPMorgan Chase Bank, N.A., are defendants, putative defendants or respondents in numerous legal proceedings, including private, civil litigations and regulatory/government investigations. The litigations range from individual actions involving a single plaintiff to class action lawsuits with potentially millions of class members. Investigations involve both formal and informal proceedings, by both governmental agencies and self-regulatory organizations. These legal proceedings are at varying stages of adjudication, arbitration or investigation, and involve each of JPMorgan Chase's lines of business and several geographies and a wide variety of claims (including common law tort and contract claims and statutory antitrust, securities and consumer protection claims), some of which present novel legal theories.

JPMorgan Chase believes the estimate of the aggregate range of reasonably possible losses, in excess of reserves established, for its legal proceedings is from \$0 to approximately \$1.3 billion at December 31, 2019. This estimated aggregate range of reasonably possible losses was based upon information available as of that date for those proceedings in which JPMorgan Chase believes that an estimate of reasonably possible loss can be made. For certain matters, JPMorgan Chase does not believe that such an estimate can be made, as of that date. JPMorgan Chase's estimate of the aggregate range of reasonably possible losses involves significant judgment, given:

- the number, variety and varying stages of the proceedings, including the fact that many are in preliminary stages,
- the existence in many such proceedings of multiple defendants, including JPMorgan Chase and JPMorgan Chase Bank, N.A., whose share of liability (if any) has yet to be determined,
- the numerous yet-unresolved issues in many of the proceedings, including issues regarding class certification and the scope of many of the claims, and
- the attendant uncertainty of the various potential outcomes of such proceedings, including where JPMorgan Chase has made assumptions concerning future rulings by the court or other adjudicator, or about the behavior or incentives of adverse parties or regulatory authorities, and those assumptions prove to be incorrect.

In addition, the outcome of a particular proceeding may be a result which JPMorgan Chase did not take into account in its estimate because JPMorgan Chase had deemed the likelihood of that outcome to be remote. Accordingly, JPMorgan Chase's estimate of the aggregate range of

reasonably possible losses will change from time to time, and actual losses may vary significantly.

Set forth below are descriptions of JPMorgan Chase's material legal proceedings in which JPMorgan Chase and its subsidiaries (which in certain instances include JPMorgan Chase Bank, N.A.) are involved or have been named as parties.

*Federal Republic of Nigeria Litigation.* JPMorgan Chase Bank, N.A. operated an escrow and depository account for the Federal Government of Nigeria ("FGN") and two major international oil companies. The account held approximately \$1.1 billion in connection with a dispute among the clients over rights to an oil field. Following the settlement of the dispute, JPMorgan Chase Bank, N.A. paid out the monies in the account in 2011 and 2013 in accordance with directions received from its clients. In November 2017, the Federal Republic of Nigeria ("FRN") commenced a claim in the English High Court for approximately \$875 million in payments made out of the accounts. The FRN, claiming to be the same entity as the FGN, alleges that the payments were instructed as part of a complex fraud not involving JPMorgan Chase Bank, N.A., but that JPMorgan Chase Bank, N.A. was or should have been on notice that the payments may be fraudulent. JPMorgan Chase Bank, N.A. applied for summary judgment and was unsuccessful. The claim is ongoing and no trial date has been set.

*Foreign Exchange Investigations and Litigation.* JPMorgan Chase previously reported settlements with certain government authorities relating to its foreign exchange ("FX") sales and trading activities and controls related to those activities. FX-related investigations and inquiries by government authorities, including competition authorities, are ongoing, and JPMorgan Chase is cooperating with and working to resolve those matters. In May 2015, JPMorgan Chase pleaded guilty to a single violation of federal antitrust law. In January 2017, JPMorgan Chase was sentenced, with judgment entered thereafter and a term of probation ending in January 2020. The term of probation has concluded, with JPMorgan Chase remaining in good standing throughout the probation period. The Department of Labor has granted JPMorgan Chase a five-year exemption of disqualification that allows JPMorgan Chase and its affiliates to continue to rely on the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act ("ERISA") until January 2023. JPMorgan Chase will need to reapply in due course for a further exemption to cover the remainder of the ten-year disqualification period. In addition, JPMorgan Chase has paid fines totaling approximately \$265 million in connection with the settlement of FX-related investigations conducted by the European Commission and the Swiss Competition Commission which were announced in May

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2019 and June 2019, respectively. Separately, in February 2017 the South Africa Competition Commission referred its FX investigation of JPMorgan Chase and other banks to the South Africa Competition Tribunal, which is conducting civil proceedings concerning that matter.

In August 2018, the United States District Court for the Southern District of New York granted final approval to JPMorgan Chase's settlement of a consolidated class action brought by U.S.-based plaintiffs, which principally alleged violations of federal antitrust laws based on an alleged conspiracy to manipulate foreign exchange rates and also sought damages on behalf of persons who transacted in FX futures and options on futures. Certain members of the settlement class filed requests to the Court to be excluded from the class, and certain of them filed a complaint against JPMorgan Chase and a number of other foreign exchange dealers in November 2018. A number of these actions remain pending. Further, putative class actions have been filed against JPMorgan Chase and a number of other foreign exchange dealers on behalf of certain consumers who purchased foreign currencies at allegedly inflated rates and purported indirect purchasers of FX instruments; these actions also remain pending in the District Court. In addition, some FX-related individual and putative class actions based on similar alleged underlying conduct have been filed outside the U.S., including in the U.K., Israel and Australia.

*Interchange Litigation.* Groups of merchants and retail associations filed a series of class action complaints alleging that Visa and Mastercard, as well as certain banks, conspired to set the price of credit and debit card interchange fees and enacted related rules in violation of antitrust laws. In 2012, the parties initially settled the cases for a cash payment, a temporary reduction of credit card interchange, and modifications to certain credit card network rules. In 2017, after the approval of that settlement was reversed on appeal, the case was remanded to the District Court for further proceedings consistent with the appellate decision.

The original class action was divided into two separate actions, one seeking primarily monetary relief and the other seeking primarily injunctive relief. In September 2018, the parties to the class action seeking monetary relief finalized an agreement which amends and supersedes the prior settlement agreement. Pursuant to this settlement, the defendants collectively contributed an additional \$900 million to the approximately \$5.3 billion previously held in escrow from the original settlement. In December 2019, the amended agreement was approved by the District Court. Certain merchants filed notices of appeal of the District Court's approval order. Based on the percentage of merchants that opted out of the amended class settlement, \$700 million has been returned to the defendants from the settlement escrow in accordance with the settlement agreement. The class action seeking primarily injunctive

relief continues separately.

In addition, certain merchants have filed individual actions raising similar allegations against Visa and Mastercard, as well as against JPMorgan Chase and other banks, and those actions are proceeding.

*LIBOR and Other Benchmark Rate Investigations and Litigation.* JPMorgan Chase has responded to inquiries from various governmental agencies and entities around the world relating primarily to the British Bankers Association's London Interbank Offered Rate ("LIBOR") for various currencies and the European Banking Federation's Euro Interbank Offered Rate ("EURIBOR"). The Swiss Competition Commission's investigation relating to EURIBOR, to which JPMorgan Chase and other banks are subject, continues. In December 2016, the European Commission issued a decision against JPMorgan Chase and other banks finding an infringement of European antitrust rules relating to EURIBOR. JPMorgan Chase has filed an appeal of that decision with the European General Court, and that appeal is pending.

In addition, JPMorgan Chase has been named as a defendant along with other banks in a series of individual and putative class actions related to benchmarks, including U.S. dollar LIBOR during the period that it was administered by the BBA and, in a separate consolidated putative class action, during the period that it was administered by ICE Benchmark Administration. These actions have been filed, or consolidated for pre-trial purposes, in the United States District Court for the Southern District of New York. In these actions, plaintiffs make varying allegations that in various periods, starting in 2000 or later, defendants either individually or collectively manipulated various benchmark rates by submitting rates that were artificially low or high. Plaintiffs allege that they transacted in loans, derivatives or other financial instruments whose values are affected by changes in these rates and assert a variety of claims including antitrust claims seeking treble damages. These actions are in various stages of litigation.

In actions related to U.S. dollar LIBOR during the period that it was administered by the BBA, the District Court dismissed certain claims, including antitrust claims brought by some plaintiffs whom the District Court found did not have standing to assert such claims, and permitted certain claims to proceed, including antitrust, Commodity Exchange Act, Section 10(b) of the Securities Exchange Act and common law claims. The plaintiffs whose antitrust claims were dismissed for lack of standing have filed an appeal. The District Court granted class certification of antitrust claims related to bonds and interest rate swaps sold directly by the defendants and denied class certification motions filed by other plaintiffs. JPMorgan Chase's settlements of putative class actions related to Swiss franc LIBOR, the Singapore Interbank Offered Rate and the Singapore Swap Offer Rate ("SIBOR"), the Australian Bank Bill Swap Reference Rate, and certain of the putative class actions related to U.S.

dollar LIBOR remain subject to court approval. In the class actions related to SIBOR and Swiss franc LIBOR, the District Court concluded that the Court lacked subject matter jurisdiction, and plaintiffs' appeals of those decisions are pending.

*Metals and U.S. Treasuries Investigations and Litigation and Related Inquiries.* Various authorities, including the Department of Justice's Criminal Division, are conducting investigations relating to trading practices in the metals markets and related conduct. JPMorgan Chase also is responding to related requests concerning similar trading-practices issues in markets for other financial instruments, such as U.S. Treasuries. JPMorgan Chase continues to cooperate with these investigations and is currently engaged in discussions with various regulators about resolving their respective investigations. There is no assurance that such discussions will result in settlements. Several putative class action complaints have been filed in the United States District Court for the Southern District of New York against JPMorgan Chase and certain former employees, alleging a precious metals futures and options price manipulation scheme in violation of the Commodity Exchange Act. Some of the complaints also allege unjust enrichment and deceptive acts or practices under the General Business Law of the State of New York. The Court consolidated these putative class actions in February 2019. JPMorgan Chase is also a defendant in a consolidated action filed in the United States District Court for the Southern District of New York alleging monopolization of silver futures in violation of the Sherman Act.

*Wendel.* Since 2012, the French criminal authorities have been investigating a series of transactions entered into by senior managers of Wendel Investissement ("Wendel") during the period from 2004 through 2007 to restructure their shareholdings in Wendel. JPMorgan Chase Bank, N.A., Paris branch provided financing for the transactions to a number of managers of Wendel in 2007. JPMorgan Chase has cooperated with the investigation. The investigating judges issued an *ordonnance de renvoi* in November 2016, referring JPMorgan Chase Bank, N.A. to the French *tribunal correctionnel* for alleged complicity in tax fraud. No date for trial has been set by the court. In January 2018, the Paris Court of Appeal issued a decision cancelling the *mise en examen* of JPMorgan Chase Bank, N.A. The Court of Cassation, France's highest court, ruled in September 2018 that a *mise en examen* is a prerequisite for an *ordonnance de renvoi* and in January 2020 ordered the annulment of the *ordonnance de renvoi* referring JPMorgan Chase Bank, N.A. to the French *tribunal correctionnel*. In addition, a number of the managers have commenced civil proceedings against JPMorgan Chase Bank, N.A. The claims are separate, involve different allegations and are at various stages of proceedings.

\* \* \*

In addition to the various legal proceedings discussed above, JPMorgan Chase and its subsidiaries, including in certain cases, JPMorgan Chase Bank, N.A., are named as

defendants or are otherwise involved in a substantial number of other legal proceedings. JPMorgan Chase and JPMorgan Chase Bank, N.A., each believe 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.

JPMorgan Chase Bank, N.A. has established reserves for several hundred of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, JPMorgan Chase Bank, N.A. 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. JPMorgan Chase Bank, N.A. 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. JPMorgan Chase Bank, N.A.'s legal expense/ (benefit) was \$206 million, \$75 million and \$(135) million for the years ended December 31, 2019, 2018 and 2017, respectively. Where a particular litigation matter involves one or more subsidiaries or affiliates of JPMorgan Chase, JPMorgan Chase determines the appropriate allocation of legal expense among those subsidiaries or affiliates (including, where applicable, JPMorgan Chase Bank, N.A.). There is no assurance that JPMorgan Chase Bank N.A.'s litigation reserves will not need to be adjusted in the future.

In view of the inherent difficulty of predicting the outcome of legal proceedings, particularly where the claimants seek very large or indeterminate damages, or where the matters present novel legal theories, involve a large number of parties or are in early stages of discovery, JPMorgan Chase Bank, N.A. cannot state with confidence what will be the eventual outcomes of the currently pending matters, the timing of their ultimate resolution or the eventual losses, fines, penalties or consequences related to those matters. JPMorgan Chase Bank, N.A. believes, based upon its current knowledge and after consultation with counsel, consideration of the material legal proceedings described above and after taking into account its current litigation reserves and its estimated aggregate range of possible losses, that the other legal proceedings currently pending against it should not have a material adverse effect on JPMorgan Chase's Bank, N.A.'s consolidated financial condition. JPMorgan Chase Bank, N.A. notes, however, that in light of the uncertainties involved in such proceedings, there is no assurance that the ultimate resolution of these matters will not significantly exceed the reserves it has currently accrued or that a matter will not have material reputational consequences. As a result, the outcome of a particular matter may be material to JPMorgan Chase Bank, N.A.'s operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of JPMorgan Chase Bank, N.A.'s income for that period.

## Notes to consolidated financial statements

JPMorgan Chase Bank, National Association  
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

### Note 29 – Business changes and developments

#### Internal transfers of legal entities under common control

From time to time there may be transfers of legal entities under common control between the Bank and JPMorgan Chase. Such transfers are accounted for at historical cost in accordance with U.S. GAAP and are reflected in the Consolidated Financial Statements prospectively when the impact of the transfers are not material to the Bank's Consolidated Financial Statements. Other than the Merger discussed in Note 1, there were no significant internal transfers of legal entities between the Bank and JPMorgan Chase for the years ended December 31, 2019, 2018 and 2017.

#### Subsequent events

The Bank has performed an evaluation of events that have occurred subsequent to December 31, 2019, and through February 25, 2020 (the date the financial statements were available to be issued). There have been no material subsequent events that occurred during such period that would require disclosure or recognition in the Bank's Consolidated Financial Statements as of December 31, 2019.

## Supplementary information:

### Glossary of Terms and Acronyms

**2019 Form 10-K:** JPMorgan Chase & Co.'s Annual report on Form 10-K for year ended December 31, 2019, filed with the U.S. Securities and Exchange Commission.

**ABS:** Asset-backed securities

**AFS:** Available-for-sale

**AOI:** Accumulated other comprehensive income/(loss)

**ARM:** Adjustable rate mortgage(s)

**Bank:** JPMorgan Chase Bank N.A.

**Beneficial interests issued by consolidated VIEs:** Represents the interest of third-party holders of debt, equity securities, or other obligations, issued by VIEs that the Bank consolidates.

**Benefit obligation:** Refers to the projected benefit obligation for pension plans and the accumulated postretirement benefit obligation for OPEB plans.

**BHC:** Bank holding company

**CCP: "Central counterparty"** is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement.

**CDS:** Credit default swaps

**CECL:** Financial Instruments - Credit Losses, commonly referred to as the Current Expected Credit Losses framework

**CET1 Capital:** Common equity Tier 1 capital

**CFO:** Chief Financial Officer

**CFTC:** Commodity Futures Trading Commission

**Chase Bank USA, N.A.:** Chase Bank USA, National Association

**CLO:** Collateralized loan obligations

**CLTV:** Combined loan-to-value

**Collateral-dependent:** A loan is considered to be collateral-dependent when repayment of the loan is expected to be provided solely by the underlying collateral, rather than by cash flows from the borrower's operations, income or other resources.

**Credit derivatives:** Financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Upon the occurrence of a credit event by the reference entity, which may include,

among other events, the bankruptcy or failure to pay its obligations, or certain restructurings of the debt of the reference entity, neither party has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value at the time of settling the credit derivative contract. The determination as to whether a credit event has occurred is generally made by the relevant International Swaps and Derivatives Association ("ISDA") Determinations Committee.

**Criticized:** Criticized loans, lending-related commitments and derivative receivables that are classified as special mention, substandard and doubtful categories for regulatory purposes.

**CRO:** Chief Risk Officer

**CVA:** Credit valuation adjustment

**DVA:** Debit valuation adjustment

**EC:** European Commission

**Embedded derivatives:** are implicit or explicit terms or features of a financial instrument that affect some or all of the cash flows or the value of the instrument in a manner similar to a derivative. An instrument containing such terms or features is referred to as a "hybrid." The component of the hybrid that is the non-derivative instrument is referred to as the "host." For example, callable debt is a hybrid instrument that contains a plain vanilla debt instrument (i.e., the host) and an embedded option that allows the issuer to redeem the debt issue at a specified date for a specified amount (i.e., the embedded derivative). However, a floating rate instrument is not a hybrid composed of a fixed-rate instrument and an interest rate swap.

**ERISA:** Employee Retirement Income Security Act of 1974

**ETD: "Exchange-traded derivatives":** Derivative contracts that are executed on an exchange and settled via a central clearing house.

**Fannie Mae:** Federal National Mortgage Association

**FASB:** Financial Accounting Standards Board

**FDIA:** Federal Depository Insurance Act

**FDIC:** Federal Deposit Insurance Corporation

**Federal Reserve:** The Board of the Governors of the Federal Reserve System

**FFIEC:** Federal Financial Institutions Examination Council

**FHA:** Federal Housing Administration

**FHLB:** Federal Home Loan Bank

**FICC:** The Fixed Income Clearing Corporation

**FICO score:** A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the

## Glossary of Terms and Acronyms

credit bureaus.

**Free standing derivatives:** a derivative contract entered into either separate and apart from any of the Bank's other financial instruments or equity transactions. Or, in conjunction with some other transaction and is legally detachable and separately exercisable.

**FVA:** Funding valuation adjustment

**FX:** Foreign exchange

**G7: Group of Seven nations:** Countries in the G7 are Canada, France, Germany, Italy, Japan, the U.K. and the U.S.

**G7 government bonds:** Bonds issued by the government of one of the G7 nations.

**Ginnie Mae:** Government National Mortgage Association

**HELOAN:** Home equity loan

**HELOC:** Home equity line of credit

**Home equity – senior lien:** Represents loans and commitments where the Bank holds the first security interest on the property.

**Home equity – junior lien:** Represents loans and commitments where the Bank holds a security interest that is subordinate in rank to other liens.

**HTM:** Held-to-maturity

**IDI:** Insured depository institutions

**Impaired loan:** Impaired loans are loans measured at amortized cost, for which it is probable that the Bank will be unable to collect all amounts due, including principal and interest, according to the contractual terms of the agreement. Impaired loans include the following:

- All wholesale nonaccrual loans
- All TDRs (both wholesale and consumer), including ones that have returned to accrual status

**Investment-grade:** An indication of credit quality based on the Bank's internal risk assessment. The Bank considers ratings of BBB-/Baa3 or higher as investment-grade.

**ISDA:** International Swaps and Derivatives Association

**JPMorgan Chase:** JPMorgan Chase & Co.

**LGD:** Loss given default

**LIBOR:** London Interbank Offered Rate

**LTIP:** Long-term incentive plan

**LTV: "Loan-to-value":** For residential real estate loans, the relationship, expressed as a percentage, between the principal amount of a loan and the appraised value of the collateral (i.e., residential real estate) securing the loan.

*Origination date LTV ratio*

The LTV ratio at the origination date of the loan. Origination date LTV ratios are calculated based on the actual appraised values of collateral (i.e., loan-level data) at the origination date.

*Current estimated LTV ratio*

An estimate of the LTV as of a certain date. The current estimated LTV ratios are calculated using estimated collateral values derived from a nationally recognized home price index measured at the metropolitan statistical area ("MSA") level. These MSA-level home price indices consist of actual data to the extent available and forecasted data where actual data is not available. As a result, the estimated collateral values used to calculate these ratios do not represent actual appraised loan-level collateral values; as such, the resulting LTV ratios are necessarily imprecise and should therefore be viewed as estimates.

*Combined LTV ratio*

The LTV ratio considering all available lien positions, as well as unused lines, related to the property. Combined LTV ratios are used for junior lien home equity products.

**Master netting agreement:** A single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due).

**Measurement alternative:** Measures equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer.

**Merger:** On May 18, 2019, JPMorgan Chase merged its wholly-owned subsidiary, Chase Bank USA, N.A. with and into JPMorgan Chase Bank, N.A., with JPMorgan Chase Bank, N.A. as the surviving bank.

**MBS:** Mortgage-backed securities

**Moody's:** Moody's Investor Services

**Mortgage product types:**

*Alt-A*

Alt-A loans are generally higher in credit quality than subprime loans but have characteristics that would disqualify the borrower from a traditional prime loan. Alt-A lending characteristics may include one or more of the following: (i) limited documentation; (ii) a high CLTV ratio; (iii) loans secured by non-owner occupied properties; or (iv) a debt-to-income ratio above normal limits. A substantial proportion of the Bank's Alt-A loans are those where a borrower does not provide complete documentation of his or her assets or the amount or source of his or her income.

## Glossary of Terms and Acronyms

### *Option ARMs*

The option ARM real estate loan product is an adjustable-rate mortgage loan that provides the borrower with the option each month to make a fully amortizing, interest-only or minimum payment. The minimum payment on an option ARM loan is based on the interest rate charged during the introductory period. This introductory rate is usually significantly below the fully indexed rate. The fully indexed rate is calculated using an index rate plus a margin. Once the introductory period ends, the contractual interest rate charged on the loan increases to the fully indexed rate and adjusts monthly to reflect movements in the index. The minimum payment is typically insufficient to cover interest accrued in the prior month, and any unpaid interest is deferred and added to the principal balance of the loan. Option ARM loans are subject to payment recast, which converts the loan to a variable-rate fully amortizing loan upon meeting specified loan balance and anniversary date triggers.

### *Prime*

Prime mortgage loans are made to borrowers with good credit records who meet specific underwriting requirements, including prescriptive requirements related to income and overall debt levels. New prime mortgage borrowers provide full documentation and generally have reliable payment histories.

### *Subprime*

Subprime loans are loans that, prior to mid-2008, were offered to certain customers with one or more high risk characteristics, including but not limited to: (i) unreliable or poor payment histories; (ii) a high LTV ratio of greater than 80% (without borrower-paid mortgage insurance); (iii) a high debt-to-income ratio; (iv) an occupancy type for the loan is other than the borrower's primary residence; or (v) a history of delinquencies or late payments on the loan.

**MSA:** Metropolitan statistical areas

**MSR:** Mortgage servicing rights

**NA:** Data is not applicable or available for the period presented.

**NAV:** Net Asset Value

**Net interchange income** includes the following components:

- **Interchange income:** Fees earned by credit and debit card issuers on sales transactions.
- **Reward costs:** The cost to the Bank for points earned by cardholders enrolled in credit card rewards programs.
- **Partner payments:** Payments to co-brand credit card partners based on the cost of loyalty program rewards earned by cardholders on credit card transactions.

**Net mortgage servicing revenue:** Includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

**Net production revenue:** Includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Net production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option.

**NOL:** Net operating loss

**Nonaccrual loans:** Loans for which interest income is not recognized on an accrual basis. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest have been in default for a period of 90 days or more unless the loan is both well-secured and in the process of collection. Collateral-dependent loans are typically maintained on nonaccrual status.

**OAS:** Option-adjusted spread

**OCC:** Office of the Comptroller of the Currency

**OCI:** Other comprehensive income/(loss)

**OPEB:** Other postretirement employee benefit

**OTTI:** Other-than-temporary impairment

**Over-the-counter ("OTC") derivatives:** Derivative contracts that are negotiated, executed and settled bilaterally between two derivative counterparties, where one or both counterparties is a derivatives dealer.

**Over-the-counter cleared ("OTC-cleared") derivatives:** Derivative contracts that are negotiated and executed bilaterally, but subsequently settled via a central clearing house, such that each derivative counterparty is only exposed to the default of that clearing house.

**PCI: "Purchased credit-impaired" loans** represents certain loans that were acquired and deemed to be credit-impaired on the acquisition date in accordance with the guidance of the FASB. The guidance allows purchasers to aggregate credit-impaired loans acquired in the same fiscal quarter into one or more pools, provided that the loans have

## Glossary of Terms and Acronyms

common risk characteristics (e.g., product type, LTV ratios, FICO scores, past due status, geographic location). A pool is then accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows.

**PD:** Probability of default

**Principal transactions revenue:** Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Bank and the price at which another market participant is willing and able to buy it from the Bank, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities, and on private equity investments.
  - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
  - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Bank transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk.

**PSUs:** Performance share units

**REIT: “Real estate investment trust”:** A special purpose investment vehicle that provides investors with the ability to participate directly in the ownership or financing of real-estate related assets by pooling their capital to purchase and manage income property (i.e., equity REIT) and/or mortgage loans (i.e., mortgage REIT). REITs can be publicly or privately held and they also qualify for certain favorable tax considerations.

**REO:** Real estate owned

**Retained loans:** Loans that are held-for-investment (i.e., excludes loans held-for-sale and loans at fair value).

**RHS:** Rural Housing Service of the U.S. Department of Agriculture

**Risk-rated portfolio:** Credit loss estimates are based on estimates of the probability of default (“PD”) and loss severity given a default. The probability of default is the

likelihood that a borrower will default on its obligation; the loss given default (“LGD”) is the estimated loss on the loan that would be realized upon the default and takes into consideration collateral and structural support for each credit facility.

**ROU assets:** Right-of-use assets

**RSU(s):** Restricted stock units

**RWA: “Risk-weighted assets”:** Basel III establishes two comprehensive approaches for calculating RWA (a Standardized approach and an Advanced approach) which include capital requirements for credit risk, market risk, and in the case of Basel III Advanced, also operational risk. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced.

**Scored portfolio:** The scored portfolio predominantly includes residential real estate loans, credit card loans and certain auto and business banking loans where credit loss estimates are based on statistical analysis of credit losses over discrete periods of time. The statistical analysis uses portfolio modeling, credit scoring and decision-support tools.

**S&P:** Standard and Poor’s 500 Index

**SAR(s):** Stock appreciation rights

**SEC:** Securities and Exchange Commission

**Securities financing agreements:** Include resale, repurchase, securities borrowed and securities loaned agreements

**SLR:** Supplementary leverage ratio

**SMBS:** Stripped mortgage-backed securities

**SPES:** Special purpose entities

**Structured notes:** Structured notes are financial instruments whose cash flows are linked to the movement in one or more indexes, interest rates, foreign exchange rates, commodities prices, prepayment rates, or other market variables. The notes typically contain embedded (but not separable or detachable) derivatives. Contractual cash flows for principal, interest, or both can vary in amount and timing throughout the life of the note based on non-traditional indexes or non-traditional uses of traditional interest rates or indexes.

## Glossary of Terms and Acronyms

**TDR: “Troubled debt restructuring”** is deemed to occur when the Bank modifies the original terms of a loan agreement by granting a concession to a borrower that is experiencing financial difficulty.

**U.K.:** United Kingdom

**Unaudited:** Financial statements and information that have not been subjected to auditing procedures sufficient to permit an independent certified public accountant to express an opinion.

**U.S.:** United States of America

**U.S. government agencies:** U.S. government agencies include, but are not limited to, agencies such as Ginnie Mae and FHA, and do not include Fannie Mae and Freddie Mac which are U.S. government-sponsored enterprises (“U.S. GSEs”). In general, obligations of U.S. government agencies are fully and explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government in the event of a default.

**U.S. GAAP:** Accounting principles generally accepted in the U.S.

**U.S. GSE(s):** “U.S. government-sponsored enterprises” are quasi-governmental, privately-held entities established or chartered by the U.S. government to serve public purposes as specified by the U.S. Congress to improve the flow of credit to specific sectors of the economy and provide certain essential services to the public. U.S. GSEs include Fannie Mae and Freddie Mac, but do not include Ginnie Mae or FHA. U.S. GSE obligations are not explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government.

**U.S. Treasury:** U.S. Department of the Treasury

**VA:** U.S. Department of Veterans Affairs

**VCG:** Valuation Control Group

**VGf:** Valuation Governance Forum

**VIes:** Variable interest entities

**Warehouse loans:** Consist of prime mortgages originated with the intent to sell that are accounted for at fair value and classified as trading assets.