J.P.Morgan

業務及び財産の状況に関する説明書

令和 4 年 12 月期

JP モルガン・チェース銀行
東 京 支 店

この説明書は、銀行法第21条および銀行法施行規則第19条の2 （業務および財産の状況に関する説明書類の縦覧等）に基づき、当行在日支店ならびに当行の業務および財産の状況に関し作成したものです。

目　次

1. 外国銀行在日支店に係る事項

１）JP モルガン・チェース銀行東京支店の概況

イ．代表者

李家　輝：　　日本における代表者(兼)東京支店長

ロ．ジェー・ピー・モルガン・チェース・バンク・ナショナル・アソシエーションの大株主

	氏名又は名称	保有株式数	発行株式総数に対する保有株の割合（%）
1	ジェー・ピー・モルガン・チェース・アンド・カンパニー	168,971 千株	100%
			以上

ハ．営業所の名称及び所在地

JP モルガン・チェース銀行　東京支店

東京都千代田区丸の内２丁目７番３号　東京ビルディング

２）直近の事業年度における事業の概況

（１）　東京支店の事業内容について

JP モルガン・チェース・グループにおけるコーポレート・アンド・インベストメント・バンク部門のホールセール事業の日本における拠点として、日本の事業会社及び金融機関に対し、グループの持つグローバル機能を生かし、主として外国為替、デリバティブ、与信業務、財務サービス等を提供しています。

（２）　令和 4 年 12 月期の事業の概況

当期の経常損益は 24.3 億円の利益となりました。主に、資金の運用・調達に関する収支を 121.6 億円(損失)、役務取引等収支を 43.3 億円、その他業務に関する収支を 208.4 億円、その他経常収益を 24.8 億円、営業経費を 130.6 億円計上したことによります。

税引前当期純損益は 24.3 億円の利益、法人税等を差し引いた当期純損益は 5.8 億円の利益となりました。

３）直近の２事業年度における貸借対照表及び損益計算書

貸借対照表

（単位：百万円）

科　　　目	令和4年12月31日	令和3年12月31日	科　　　目	令和4年12月31日	令和3年12月31日
資産の部			**負債の部**		
現金預け金	**6,352,615**	**4,158,500**	**預金**	**710,918**	**572,177**
現金	10	35	当座預金	132,562	105,325
預け金	6,352,604	4,158,465	普通預金	124,532	112,869
コールローン	**－**	**274,000**	その他の預金	453,823	353,981
債券貸借取引支払保証金	**59,791**	**－**	**コールマネー**	**277,000**	**－**
買入金銭債権	**749**	**623**	**外国為替**	**67,864**	**36,197**
有価証券	**11,008**	**84,833**	外国他店預り	67,864	36,197
国債	11,008	84,833	外国他店借	0	0
貸出金	**112,102**	**133,220**	**その他負債**	**2,594,895**	**1,525,821**
証書貸付	8,028	27,823	未払法人税等	2,128	31
当座貸越	104,073	105,397	未払費用	4,802	2,520
外国為替	**18,419**	**6,466**	前受収益	233	104
外国他店預け	15,971	5,043	金融派生商品	2,064,581	1,367,916
外国他店貸	381	783	金融商品等受入担保金	501,001	148,341
買入外国為替	2,065	639	その他の負債	22,147	6,905
その他資産	**2,185,013**	**1,439,018**	**賞与引当金**	**2,588**	**1,713**
前払費用	30	27	**繰延税金負債**	**－**	**62**
未収収益	3,801	1,872	**支払承諾**	**10,294**	**10,044**
未収還付法人税等	－	756	**本支店勘定**	**5,315,718**	**4,183,823**
金融派生商品	2,044,803	1,373,075	本店	2,910,818	2,424,800
金融商品等差入担保金	121,150	58,562	在外支店	2,404,900	1,759,022
その他の資産	15,226	4,725			
有形固定資産	**5**	**10**			
その他の有形固定資産	5	10	**負債の部合計**	**8,979,280**	**6,329,839**
無形固定資産	**138**	**65**	**純資産の部**		
ソフトウエア	138	65	**持込資本金**	**2,000**	**2,000**
前払年金費用	**513**	**402**	**繰越利益剰余金**	**△945**	**△1,250**
支払承諾見返	**10,294**	**10,044**	**その他有価証券評価差額金**	**△1**	**141**
貸倒引当金	**△12**	**△108**			
本支店勘定	**229,693**	**223,651**			
本店	9,330	12,695			
在外支店	220,362	210,956			
			純資産の部合計	**1,053**	**890**
資産の部合計	**8,980,333**	**6,330,730**	**負債及び純資産の部合計**	**8,980,333**	**6,330,730**

損益計算書

（単位：百万円）

科　　　目	令和　4　年　1　月　1　日から 令和　4　年　12　月　31　日まで	令和　3　年　1　月　1　日から 令和　3　年　12　月　31　日まで
経常収益	**31,723**	**10,514**
資金運用収益	1,914	△ 64
貸出金利息	2,067	598
有価証券利息配当金	0	105
コールローン利息	△ 431	△ 406
債券貸借取引受入利息	4	0
預け金利息	△ 1,410	△ 633
外国為替受入利息	175	101
本支店為替尻受入利息	1,529	173
その他の受入利息	△ 20	△ 4
役務取引等収益	4,668	3,955
外国為替受入手数料	1,635	1,398
内国為替受入手数料	418	374
その他の役務収益	2,614	2,182
その他業務収益	22,641	4,862
外国為替売買益	18,044	2,241
その他の業務収益	4,596	2,621
その他経常収益	2,498	1,760
貸倒引当金戻入益	95	-
その他の経常収益	2,403	1,760
経常費用	**29,289**	**11,227**
資金調達費用	14,080	△ 945
預金利息	3,012	196
コールマネー利息	△ 278	△ 219
債券貸借取引支払利息	0	△ 0
借用金利息	0	0
外国為替支払利息	2	1
本支店為替尻支払利息	11,367	△ 899
その他の支払利息	△ 24	△ 24
役務取引等費用	334	361
外国為替支払手数料	33	32
内国為替支払手数料	65	72
その他の役務費用	234	257
その他業務費用	1,796	1,131
国債等債券売却損	1,120	-
金融派生商品費用	477	640
その他の業務費用	198	490
営業経費	13,067	10,666
その他経常費用	10	12
貸倒引当金繰入額	-	12
その他の経常費用	10	-
経常利益又は経常損失（△）	**2,433**	**△ 712**
税引前当期純利益又は税引前当期純損失（△）	**2,433**	**△ 712**
法人税、住民税及び事業税	**1,848**	**3**
過年度法人税等	**△ 1**	**76**
法人税等合計	**1,846**	**80**
当期純利益又は当期純損失（△）	**586**	**△ 792**
繰越利益剰余金(当期首残高)	**△ 1,250**	**△ 1,216**
本店への送金又は本店からの補填金（△）	**281**	**△ 758**
繰越利益剰余金	**△ 945**	**△ 1,250**

記載金額は百万円未満を切り捨てて表示しております。

重要な会計方針

1. 有価証券の評価基準及び評価方法

　有価証券の評価は、決算日の市場価格等に基づく時価法（売却原価は主として移動平均法により算定）により行っております。なお、その他有価証券の評価差額については、全部純資産直入法により処理しております。

2. デリバティブ取引の評価基準及び評価方法

　デリバティブ取引（特定取引目的の取引を除く）の評価は、時価法により行っております。

3. 固定資産の減価償却の方法

（1） 有形固定資産

その他の有形固定資産は、定率法を採用しております。

主な耐用年数は以下の通りであります。

その他の有形固定資産　4 年～20 年

（2） 無形固定資産

定額法を採用しております。なお、自社利用のソフトウェアについては、当支店における利用可能期間（5 年）に基づいて償却しております。

4. 外貨建の資産及び負債の本邦通貨への換算基準

　外貨建資産・負債及び海外本支店勘定は、決算日の為替相場による円換算額を付しております。

5. 引当金の計上基準

（1）貸倒引当金

　貸倒引当金は、予め定めている償却・引当基準に則り、次のとおり計上しております。

　「銀行等金融機関の資産の自己査定並びに貸倒償却及び貸倒引当金の監査に関する実務指針」（日本公認会計士協会銀行等監査特別委員会報告第４号　令和 4 年 4 月 14 日）に規定する正常先債権及び要注意先債権に相当する債権については、一定の種類毎に分類し、過去の一定期間における各々の貸倒実績から算出した貸倒実績率等に基づき、これに将来見込み等必要な修正を加えて予想損失額を計上しております。

　すべての債権は、資産の自己査定基準に基づき、審査部及び財務部が共同して資産査定を実施しております。

（2）賞与引当金

　賞与引当金は、従業員への賞与の支払いに備えるため、及び親会社の運営する株式報酬制度にかかる将来の費用負担に備えるため、当事業年度に帰属する額を計上しております。

（3）退職給付引当金

　退職給付引当金は、従業員の退職給付に備えるため、当事業年度末における退職給付債務及び年金資産の見込額に基づき、必要額を計上しております。当事業年度末においては、年金資産の額が退職給付債務から未認識項目の合計額を控除した額を超過しているため、前払年金費用として貸借対照表に計上しております。また、退職給付債務の算定にあたり、退職給付見込額を当事業年度末までの期間に帰属させる方法については期間定額基準によっております。なお、過去勤務費用及び数理計算上の差異の費用処理方法は次のとおりであります。

過去勤務費用：	その発生時の従業員の平均残存勤務期間内の一定の年数（10 年）による定額法により費用処理
数理計算上の差異：	各事業年度の発生時の従業員の平均残存勤務期間内の一定の年数（10 年）による定額法により按分した額を、それぞれ発生の翌事業年度から費用処理

6.　収益の計上方法

①　収益の認識方法
顧客との契約から生じる収益は、約束した財又はサービスの支配が顧客に移転した時点で、当該財又はサービスと交換に受け取ると見込まれる金額で収益を認識しております。
②　主な取引における収益の認識
「収益認識に関する会計基準」（企業会計基準第 29 号 令和 2 年 3 月 31 日）等が適用される顧客との契約から生じる収益は「役務取引等収益」に含まれており、そのうち主要なものは為替業務によるサービス提供からの収益及び預金業務に係る収益であります。
為替業務に係る収益は、主に国内外の送金・振込手数料による収益であり、対応するサービスが提供された時点で収益を認識しております。
預金業務に係る収益は、主にインターネットバンキングサービスからの収益が含まれており、対応するサービスが提供された時点で収益を認識しております。

会計方針の変更

（収益認識に関する会計基準等の適用）
「収益認識に関する会計基準」（企業会計基準第 29 号 令和 2 年 3 月 31 日。以下「収益認識会計基準」という。）等を当事業年度の期首から適用し、約束した財又はサービスの支配が顧客に移転した時点で、当該財又はサービスと交換に受け取ると見込まれる金額で収益を認識することといたしました。
収益認識会計基準等の適用については、収益認識会計基準第 84 項ただし書きに定める経過的な取扱いに従っておりますが、繰越利益剰余金の当事業年度の期首残高に与える影響はありません。なお、当該会計方針の変更による財務諸表への影響はありません。

（時価の算定に関する会計基準等の適用）
「時価の算定に関する会計基準」（企業会計基準第 30 号 令和元年 7 月 4 日。以下「時価算定会計基準」という。）等を当事業年度の期首から適用し、時価算定会計基準第 19 項及び「金融商品に関する会計基準」（企業会計基準第 10 号 令和元年 7 月 4 日）第 44-2 項に定める経過的な取扱いに従って、時価算定会計基準等が定める新たな会計方針を、将来にわたって適用することといたしました。なお、財務諸表に与える影響はありません。
また、「金融商品関係」注記において、金融商品の時価のレベルごとの内訳等に関する事項等の注記を行うことといたしました。

重要な会計上の見積り

会計上の見積りにより当事業年度に係る財務諸表にその額を計上した項目であって、翌事業年度に係る財務諸表に重要な影響を及ぼす可能性があるものは、貸倒引当金であります。
1.　当事業年度に係る財務諸表に計上した額

貸倒引当金　12 百万円

2.　識別した項目に係る重要な会計上の見積りの内容に関する理解に資する情報

（1）　算出方法

貸倒引当金の算出方法は、「重要な会計方針」「5. 引当金の計上基準」「(1) 貸倒引当金」に記載しております。

（2）　主要な仮定

主要な仮定は、「債務者区分の判定における与信先の将来の業績見通し」であります。「債務者区分の判定における与信先の将来の業績見通し」は、与信先の業績、債務履行状況、業種特性等をもとに収益獲得能力を個別に評価し、設定しております。

（3）　翌事業年度に係る財務諸表に及ぼす影響

特定の業界環境の変化や個別与信先の業績変化等により、当初の見積りに用いた仮定が変化した場合は、翌事業年度に係る財務諸表における貸倒引当金に重要な影響を及ぼす可能性があります。

注記事項

（貸借対照表関係）

1. 現金担保付債券貸借取引により受け入れている有価証券のうち、売却又は（再）担保という方法で自由に処分できる権利を有する有価証券で、（再）担保に差し入れている有価証券は 59,665 百万円、当事業年度末に当該処分をせずに所有している有価証券はありません。

2. 銀行法及び金融機能の再生のための緊急措置に関する法律に基づく債権（破産更生債権及びこれらに準ずる債権、危険債権、三月以上延滞債権、貸出条件緩和債権）の該当はありません。なお、債権は、貸借対照表の貸出金、外国為替、「その他資産」中の未収利息及び仮払金並びに支払承諾見返の各勘定に計上されるもの並びに注記されている有価証券の貸付けを行っている場合のその有価証券（使用貸借又は賃貸借契約によるものに限る。）であります。
   破産更生債権及びこれらに準ずる債権とは、破産手続開始、更生手続開始、再生手続開始の申立て等の事由により経営破綻に陥っている債務者に対する債権及びこれらに 準ずる債権であります。
   危険債権とは、債務者が経営破綻の状態には至っていないが、財政状態及び経営成績が悪化し、契約に従った債権の元本の回収及び利息の受取りができない可能性の高い債権で 破産更生 債権及びこれらに準ずる債権に該当しないものであります。
   三月以上延滞債権とは、元本又は利息の支払が約定支払日の翌日から三月以上遅延している貸出金で破産更生債権及びこれらに準ずる債権 並びに危険債権 に該当しないものであります。
   貸出条件緩和債権とは、債務者の経営再建又は支援を図ることを目的として、金利の減免、利息の支払猶予、元本の返済猶予、債権放棄その他の債務者に有利となる取決めを行った貸出金で破産更生債権及びこれらに準ずる債権 、危険債権並びに三月以上延滞債権に該当しないものであります。

   （表示方法の変更）
   「銀行法施行規則等の一部を改正する内閣府令」（令和 2 年 1 月 24 日　内閣府令第 3 号）が令和 4 年 3 月 31 日に施行されたことに伴い、銀行法の「リスク管理債権」の区分等を、金融機能の再生のための緊急措置に関する法律に基づく開示債権の区分等に合わせて表示しております。

3. ローン・パーティシペーションで、「ローン・パーティシペーションの会計処理及び表示」（日本公認会計士協会会計制度委員会報告第３号　平成 26 年 11 月 28 日）に基づいて、参加者に売却したものとして会計処理した貸出金の元本の期末残高の総額は 4,993 百万円であります。

4. 担保に供している資産は次のとおりであります。
   為替決済の担保として、有価証券 10,008 百万円を差し入れております。また、その他の資産には、保証金 47 百万円が含まれております。

5. 当座貸越契約及び貸付金に係るコミットメントライン契約は、顧客からの融資実行の申し出を受けた場合に、契約上規定された条件について違反がない限り、一定の限度額まで資金を貸し付けることを約する契約であります。これらの契約に係る融資未実行残高は、157,178 百万円であります。このうち契約残存期間が 1 年以内のものが 87,751 百万円あります。

6. 有形固定資産の減価償却累計額は 17 百万円であります。

7. 支店の代表者との間の取引による支店の代表者に対する金銭債権又は金銭債務として該当するものはありません。

（損益計算書注記）

1.　本店経費負担額および内訳は次のとおりです。

	令和　4　年　1　月　1　日から 令和　4　年　12　月　31　日まで
本店経費負担額	3,218
直接経費（派遣職員給与等）	99
間接経費割当額	3,119

確認書

令和 5 年 6 月 14 日

JP モルガン・チェース銀行　東京支店
日本における代表者（兼）東京支店長

李家　輝

私は、平成 17 年 10 月 7 日付金監第 2835 号に基づき、当支店の令和 4 年 1 月 1 日から令和 4 年 12 月 31 日までの事業年度（令和 4 年 12 月期）に係る財務諸表の適正性、及び財務諸表作成に係る内部監査の有効性を確認しております。

以上

JPMORGAN CHASE BANK, NATIONAL ASSOCIATION
REVIEW OF FINANCIAL PERFORMANCE
FOR THE YEAR ENDED DECEMBER 31, 2022

The following is a summary of the financial performance of JPMorgan Chase Bank, National Association for the year ended December 31, 2022.

Net income was $34.3 billion in 2022, compared with $38.1 billion in 2021, reflecting a decrease of 9.8% from the prior year. Total net revenue was $119.0 billion in 2022, compared with $104.2 billion in 2021, reflecting an increase of 14.2% from the prior year.

The provision for credit losses was $6.3 billion in 2022, compared with $(9.3) billion in 2021, reflecting an increase of 168.3% from the prior year.

Noninterest expense was $68.7 billion in 2022, compared with $64.4 billion in 2021, reflecting an increase of 6.7%. Income tax expense was $9.6 billion in 2022, compared with $11.0 billion in 2021, a decrease of 13.2% from the prior year.

As of December 31, 2022, total assets were $3.2 trillion, reflecting a decrease of 3.2% compared with 2021. As of December 31, 2022, total liabilities were $2.9 trillion, reflecting a decrease of 3.5% compared with 2021. Total stockholder's equity increased 0.3% in 2022 to $303.6 billion, compared with $302.8 billion in 2021.

JPMORGAN CHASE BANK, NATIONAL ASSOCIATION

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

CONSOLIDATED FINANCIAL STATEMENTS

For the three years ended December 31, 2022

FOR THE THREE YEARS ENDED DECEMBER 31, 2022

Report of Independent Auditors

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

Opinion

We have audited the accompanying consolidated financial statements of JPMorgan Chase Bank, National Association and its subsidiaries (the "Company"), which comprise the consolidated balance sheets as of December 31, 2022 and 2021, 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, 2022 including the related notes (collectively referred to as the "consolidated financial statements").

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022 in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (US GAAS). Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Consolidated Financial Statements section of our report. We are required to be independent of the Company and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Emphasis of Matter

As discussed in Note 1 to the consolidated financial statements, the Company changed the manner in which it accounts for credit losses on certain financial instruments in 2020. Our opinion is not modified with respect to this matter.

Responsibilities of Management 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, and for 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.

In preparing the consolidated financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern for one year after the date the consolidated financial statements are available to be issued.

Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with US GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the consolidated financial statements.

In performing an audit in accordance with US GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements.
- Obtain an understanding of internal control relevant to the audit 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, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the consolidated financial statements.

- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

PricewaterhouseCoopers LLP

February 21, 2023

PricewaterhouseCoopers LLP • 300 Madison Avenue • New York, NY 10017

Consolidated statements of income

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

Year ended December 31, (in millions)	2022	2021	2020
Revenue			
Investment banking fees	**$ 2,955**	$ 5,232	$ 3,527
Principal transactions	**17,895**	13,677	14,784
Lending- and deposit-related fees	**7,095**	7,031	6,510
Asset management, administration and commissions	**13,935**	14,021	12,406
Investment securities gains/(losses)	**(2,380)**	(345)	802
Mortgage fees and related income	**1,250**	2,170	3,092
Card income	**4,421**	5,102	4,435
Other income	**5,384**	5,511	5,931
Noninterest revenue	**50,555**	52,399	51,487
Interest income	**84,097**	53,870	58,900
Interest expense	**15,675**	2,064	4,987
Net interest income	**68,422**	51,806	53,913
Total net revenue	**118,977**	104,205	105,400
Provision for credit losses	**6,347**	(9,296)	17,483
Noninterest expense			
Compensation expense	**34,000**	31,212	28,725
Occupancy expense	**4,469**	4,313	4,249
Technology, communications and equipment expense	**8,646**	9,304	9,890
Professional and outside services	**6,983**	6,510	5,692
Marketing	**3,877**	2,936	2,338
Other expense	**10,761**	10,170	9,821
Total noninterest expense	**68,736**	64,445	60,715
Income before income tax expense	**43,894**	49,056	27,202
Income tax expense	**9,552**	11,001	6,170
Net income	**$ 34,342**	$ 38,055	$ 21,032

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)	2022	2021	2020
Net income	**$ 34,342**	$ 38,055	$ 21,032
Other comprehensive income/(loss), after-tax			
Unrealized gains/(losses) on investment securities	**(11,751)**	(5,516)	4,146
Translation adjustments, net of hedges	**(555)**	(442)	242
Cash flow hedges	**(5,359)**	(2,679)	2,322
Defined benefit pension and OPEB plans	**(742)**	688	(3)
DVA on fair value option elected liabilities	**265**	(291)	(45)
Total other comprehensive income/(loss), after-tax	**(18,142)**	(8,240)	6,662
Comprehensive income	**$ 16,200**	$ 29,815	$ 27,694

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)	2022	2021
Assets		
Cash and due from banks	$ **27,258**	$ 25,657
Deposits with banks	**538,715**	713,660
Federal funds sold and securities purchased under resale agreements (included **$193,945** and $176,980 at fair value)	**259,460**	227,457
Securities borrowed (included **$22,454** and $32,112 at fair value)	**53,642**	65,111
Trading assets (included assets pledged of **$39,458** and $49,335[a])	**288,420**	293,428
Available-for-sale securities (amortized cost of **$216,103** and $308,039, included assets pledged of **$15,274** and $31,124[a])	**205,790**	308,318
Held-to-maturity securities	**425,305**	363,707
Investment securities, net of allowance for credit losses	**631,095**	672,025
Loans (included **$41,795** and $58,471 at fair value)	**1,132,985**	1,075,106
Allowance for loan losses	**(19,714)**	(16,378)
Loans, net of allowance for loan losses	**1,113,271**	1,058,728
Accrued interest and accounts receivable	**89,373**	76,345
Premises and equipment	**26,347**	25,757
Goodwill, MSRs and other intangible assets	**48,600**	45,831
Other assets (included **$12,667** and $11,016 at fair value and assets pledged of **$2,505** and $1,750)	**125,761**	102,983
Total assets[b]	$ **3,201,942**	$ 3,306,982
Liabilities		
Deposits (included **$28,742** and $11,479 at fair value)	$ **2,440,722**	$ 2,549,631
Federal funds purchased and securities loaned or sold under repurchase agreements (included **$75,327** and $81,545 at fair value)	**85,902**	102,266
Short-term borrowings (included **$7,796** and $11,619 at fair value)	**10,074**	13,423
Trading liabilities	**116,629**	111,017
Accounts payable and other liabilities (included **$7,760** and $7,366 at fair value)	**156,433**	133,034
Beneficial interests issued by consolidated variable interest entities	**13,424**	10,721
Long-term debt (included **$27,145** and $35,633 at fair value)	**75,138**	84,042
Total liabilities[b]	**2,898,322**	3,004,134
Commitments and contingencies (refer to Notes 26, 27 and 28)		
Stockholder's equity		
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	**118,293**	118,221
Retained earnings	**201,263**	182,421
Accumulated other comprehensive income/(loss)	**(17,964)**	178
Total stockholder's equity	**303,620**	302,848
Total liabilities and stockholder's equity	$ **3,201,942**	$ 3,306,982

(a) Prior-period amounts have been revised to conform with the current presentation.

(b) The following table presents information on assets and liabilities related to variable interest entities ("VIEs") that are consolidated by the Bank at December 31, 2022 and 2021. The assets of the consolidated VIEs are used to settle the liabilities of those entities. The holders of the beneficial interests generally 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 (including balances with related parties) and exclude intercompany balances that eliminate in consolidation. Refer to Note 15 for a further discussion.

December 31, (in millions)	2022	2021
Assets		
Trading assets	$ **2,089**	$ 1,990
Loans	**34,394**	33,001
All other assets	**290**	207
Total assets	$ **36,773**	$ 35,198
Liabilities		
Beneficial interests issued by consolidated VIEs	$ **13,424**	$ 10,721
All other liabilities	**132**	144
Total liabilities	$ **13,556**	$ 10,865

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)	**2022**	2021	2020
Common stock			
Balance at January 1 and December 31	**$ 2,028**	$ 2,028	$ 2,028
Additional paid-in capital			
Balance at January 1	**118,221**	115,248	110,297
Cash capital contribution from JPMorgan Chase & Co.	**—**	3,000	5,000
Other	**72**	(27)	(49)
Balance at December 31	**118,293**	118,221	115,248
Retained earnings			
Balance at January 1	**182,421**	144,366	132,016
Cumulative effect of change in accounting principles	**—**	—	(2,682)
Net income	**34,342**	38,055	21,032
Cash dividends paid to JPMorgan Chase & Co.	**(15,500)**	—	(6,000)
Balance at December 31	**201,263**	182,421	144,366
Accumulated other comprehensive income/(loss)			
Balance at January 1	**178**	8,418	1,756
Other comprehensive income/(loss), after-tax	**(18,142)**	(8,240)	6,662
Balance at December 31	**(17,964)**	178	8,418
Total stockholder's equity	**$ 303,620**	$ 302,848	$ 270,060

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

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

Consolidated statements of cash flows

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

Year ended December 31, (in millions)	2022	2021	2020
Operating activities			
Net income	**$ 34,342**	$ 38,055	$ 21,032
Adjustments to reconcile net income to net cash provided by/(used in) operating activities:			
Provision for credit losses	**6,347**	(9,296)	17,483
Depreciation and amortization	**6,590**	7,535	8,355
Deferred tax (benefit)/expense	**(3,542)**	2,147	(3,819)
Other	**2,380**	345	(802)
Originations and purchases of loans held-for-sale	**(149,091)**	(347,864)	(166,499)
Proceeds from sales, securitizations and paydowns of loans held-for-sale	**167,713**	336,404	175,426
Net change in:			
Trading assets	**14,114**	25,806	(102,464)
Securities borrowed	**10,973**	(20,978)	(5,427)
Accrued interest and accounts receivable	**(13,088)**	(4,722)	(17,569)
Other assets	**(29,954)**	21,442	(26,435)
Trading liabilities	**7,404**	(38,612)	62,987
Accounts payable and other liabilities	**46,646**	12,529	1,455
Other operating adjustments	**8**	284	1,163
Net cash provided by/(used in) operating activities	**100,842**	23,075	(35,114)
Investing activities			
Net change in:			
Federal funds sold and securities purchased under resale agreements	**(32,211)**	116,694	(132,774)
Held-to-maturity securities:			
Proceeds from paydowns and maturities	**48,626**	50,897	21,360
Purchases	**(33,676)**	(111,756)	(12,400)
Available-for-sale securities:			
Proceeds from paydowns and maturities	**39,048**	49,505	57,518
Proceeds from sales	**84,616**	162,642	149,758
Purchases	**(126,258)**	(248,784)	(397,095)
Proceeds from sales and securitizations of loans held-for-investment	**44,910**	35,843	23,561
Other changes in loans, net	**(128,952)**	(91,019)	(50,292)
All other investing activities, net	**(8,017)**	(3,849)	(2,609)
Net cash (used in) investing activities	**(111,914)**	(39,827)	(342,973)
Financing activities			
Net change in:			
Deposits	**(111,772)**	274,351	622,154
Federal funds purchased and securities loaned or sold under repurchase agreements	**(15,795)**	(33,459)	49,262
Short-term borrowings	**(2,122)**	1,886	1,815
Beneficial interests issued by consolidated VIEs	**3,042**	(4,255)	1,329
Proceeds from long-term borrowings	**16,363**	29,783	38,373
Payments of long-term borrowings	**(20,459)**	(29,389)	(80,062)
Cash capital contribution from JPMorgan Chase & Co.	**—**	3,000	5,000
Dividends paid to JPMorgan Chase & Co.	**(15,500)**	—	(6,000)
All other financing activities, net	**576**	(148)	765
Net cash provided by/(used in) financing activities	**(145,667)**	241,769	632,636
Effect of exchange rate changes on cash and due from banks and deposits with banks	**(16,605)**	(11,469)	9,103
Net increase/(decrease) in cash and due from banks and deposits with banks	**(173,344)**	213,548	263,652
Cash and due from banks and deposits with banks at the beginning of the period	**739,317**	525,769	262,117
Cash and due from banks and deposits with banks at the end of the period	**$ 565,973**	$ 739,317	$ 525,769
Cash interest paid	**$ 13,717**	$ 1,822	$ 5,616
Cash income taxes paid, net[a]	**9,586**	16,496	9,848

(a) Includes $12.5 billion, $13.3 billion and $7.4 billion paid to JPMorgan Chase & Co. in 2022, 2021 and 2020, respectively. Refer to Note 23 for discussion of income taxes.

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

Note 1 – Overview and basis of presentation

JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A.") and its subsidiaries, (collectively, the "Bank"), is a wholly-owned bank subsidiary of JPMorgan Chase & Co. ("JPMorgan Chase"), which is a leading financial services firm based in the United States of America ("U.S."), with operations worldwide. JPMorgan Chase Bank, N.A. 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. JPMorgan Chase Bank, N.A.'s main office is located in Columbus, Ohio, and it has U.S. branches in 48 states and Washington, D.C. as of December 31, 2022. JPMorgan Chase Bank, N.A. operates nationally as well as through non-U.S. bank overseas branches and subsidiaries, representative offices and subsidiary foreign banks. 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 businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Bank serves millions of customers, predominantly in the U.S. and many of the world's most prominent corporate, institutional and government clients globally. JPMorgan Chase Bank, N.A.'s principal operating subsidiaries outside of the U.S. are J.P. Morgan Securities plc and J.P. Morgan SE, which are based in the United Kingdom ("U.K.") and Germany, respectively.

The JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of management of JPMorgan Chase Bank, N.A., which it discharges both acting directly and through the principal standing committees of JPMorgan Chase's Board of Directors. Risk and control oversight on behalf of JPMorgan Chase Bank, N.A. is primarily the responsibility of the Board 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, conduct risks, and ESG matters within its scope of responsibility.

The accounting and financial reporting policies of the Bank 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 revised to conform with the current presentation.

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").

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

In the U.K., the Bank operates a retail bank through J.P. Morgan Europe Limited ("JPMEL"). JPMEL is regulated by the PRA, and by the FCA with respect to its conduct of financial services in the U.K., including obligations relating to the fair treatment of customers. JPMEL is also regulated by the U.K. Payment Systems Regulator with respect to its operation and use of payment systems. In addition, the retail business of JPMEL is subject to U.K. consumer-protection legislation.

JPMorgan Chase Bank, N.A. is registered with the Commodity Futures Trading Commission ("CFTC") as a "swap dealer" and with the Securities and Exchange Commission ("SEC") as a "security-based swap dealer." As a result, JPMorgan Chase Bank, N.A. is subject to a comprehensive regulatory framework for its swap and security-based swap activities.

Restrictions on transactions with affiliates. The Bank is 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, 2022, filed with the U.S. Securities and Exchange Commission on February 21, 2023 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 between the consolidated Bank group of entities have been eliminated. The Bank regularly enters into transactions with JPMorgan Chase and its various subsidiaries collectively, JPMorgan Chase affiliates. These transactions are considered to be related party transactions. Refer to Note 21 for further discussion of the Bank's related party transactions.

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.

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, 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 information.

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 where it has determined that 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 on the Consolidated balance sheets.

Regulatory developments

Standardized Approach for Counterparty Credit Risk

On January 1, 2022, the Bank adopted "Standardized Approach for Counterparty Credit Risk" ("SA-CCR"), which replaced the Current Exposure Method used to measure derivatives counterparty exposure under the Standardized and Advanced approach RWA where internal models are not used, as well as leverage exposure used to calculate the SLR in the regulatory capital framework. The rule issued by the U.S. banking regulators in November 2019 applies to Basel III Advanced Approaches banking organizations, such as JPMorgan Chase and JPMorgan Chase Bank, N.A.

The Bank's risk-based capital and leverage ratios remained above the regulatory required minimum and well-capitalized capital ratios at the time of adoption.

Accounting standard adopted January 1, 2020

Financial Instruments – Credit Losses ("CECL")

The adoption of this guidance established a single allowance framework for all financial assets measured at amortized cost and certain off-balance sheet credit exposures. This framework requires that management's estimate reflects credit losses over the instrument's remaining expected life and considers expected future changes in macroeconomic conditions. Prior to the adoption of the CECL accounting guidance, the Bank's allowance for credit losses represented management's estimate of probable credit losses inherent in the Bank's retained loan portfolios and certain lending-related commitments.

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 14
Fair value option	Note 4	page 32
Derivative instruments	Note 6	page 37
Noninterest revenue and noninterest expense	Note 7	page 51
Interest income and Interest expense	Note 8	page 54
Pension and other postretirement employee benefit plans	Note 9	page 55
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 88
Variable interest entities	Note 15	page 93
Goodwill and Mortgage servicing rights	Note 16	page 101
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

Note 2 - Accounting and reporting developments

Financial Accounting Standards Board ("FASB") Standards Adopted since January 1, 2021

Standard	Summary of guidance	Effects on financial statements
Reference Rate Reform *Issued March 2020 and updated January 2021 and December 2022*	• Provides optional expedients and exceptions to current accounting guidance when financial instruments, hedge accounting relationships, and other transactions are amended due to reference rate reform. • Provides an election to account for certain contract amendments related to reference rate reform as modifications rather than extinguishments without the requirement to assess the significance of the amendments. • Allows for changes in critical terms of a hedge accounting relationship without automatic termination of that relationship. Provides various practical expedients and elections designed to allow hedge accounting to continue uninterrupted during the transition period. • Provides a one-time election to transfer securities out of the held-to-maturity classification if certain criteria are met. • The January 2021 update provides an election to account for derivatives modified to change the rate used for discounting, margining, or contract price alignment (collectively "discounting transition") as modifications. • The December 2022 update extends the termination date of the optional expedients and exceptions to current accounting guidance to December 31, 2024.	• Issued and effective March 12, 2020. The January 7, 2021 and December 21, 2022 updates were effective when issued. • The Bank elected to apply certain of the practical expedients related to contract modifications and hedge accounting relationships, and discounting transition beginning in the second half of 2020. The main purpose of the practical expedients is to ease the administrative burden of accounting for contracts impacted by reference rate reform. These elections did not have a material impact on the Consolidated Financial Statements.

FASB Standards Issued but not Adopted as of December 31, 2022		
Standard	**Summary of guidance**	**Effects on financial statements**
Derivatives and Hedging: Fair Value Hedging – Portfolio Layer Method *Issued March 2022*	• Expands the current ability to hedge a portfolio of prepayable assets to allow more of the portfolio to be hedged. Non-prepayable assets can also be included in the same portfolio, thus increasing the size of the portfolio and the amount available to be hedged. • Clarifies the types of derivatives that can be used as hedges, and the balance sheet presentation and disclosure requirements for the hedge accounting adjustments. • Allows a one-time reclassification from HTM to AFS upon adoption.	• Adopted prospectively on January 1, 2023 and, as permitted by the guidance, in January 2023 the Bank transferred and designated approximately $7.0 billion of held-to-maturity ("HTM") securities into a closed available-for-sale ("AFS") securities portfolio hedged under the portfolio layer method.
Financial Instruments - Credit Losses: Troubled Debt Restructurings and Vintage Disclosures *Issued March 2022*	• Eliminates existing accounting and disclosure requirements for Troubled Debt Restructurings, including the requirement to measure the allowance using a discounted cash flow methodology. • Requires disclosure of loan modifications for borrowers experiencing financial difficulty involving principal forgiveness, interest rate reduction, other-than-insignificant payment delay, term extension or a combination of these modifications. • Requires disclosure of current period loan charge-off information by origination year. • May be adopted prospectively, or by using a modified retrospective method wherein the effect of adoption is reflected as an adjustment to retained earnings at the effective date.	• Adopted January 1, 2023. • The adoption of this guidance eliminates the accounting and disclosure requirements for troubled debt restructurings ("TDRs"), including the requirement to measure the allowance using a discounted cash flow ("DCF") methodology, and allows the option of a non-DCF portfolio-based approach for modified loans to troubled borrowers. If a DCF methodology is still applied for these modified loans, the discount rate must be the post-modification effective interest rate, instead of the pre-modification effective interest rate. • The Bank elected to apply its non-DCF, portfolio-based allowance approach for modified loans to troubled borrowers for all portfolios except modified nonaccrual risk-rated loans which JPMorgan Chase elected to continue applying a DCF methodology. See Note 14 for a description of the portfolio-based allowance approach and the asset-specific allowance approach. • This guidance was adopted on January 1, 2023 under the modified retrospective method which resulted in a net decrease to the allowance for credit losses of approximately $600 million and an increase to retained earnings of approximately $450 million after-tax, predominantly driven by the residential real estate and credit card loan portfolios.

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. In addition, JPMorgan Chase's Valuation Governance Forum ("VGF"), which is composed of senior finance and risk executives, is responsible for overseeing the management of risks arising from valuation activities conducted across 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.

- 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, Model Risk Governance and Review ("MRGR") reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances exceptions may be granted to the Bank's policy to allow a model to be used prior to review or approval. MRGR may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

Fair value hierarchy

A three-level fair value hierarchy has been established under U.S. GAAP for disclosure of fair value measurements. The fair value hierarchy is based on the observability of inputs to the valuation of an asset or liability as of the measurement date. The three levels are defined as follows.

- Level 1 – inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2 – inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.
- Level 3 – one or more inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's categorization within the fair value hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The following table describes the valuation methodologies generally used by the Bank to measure its significant products/instruments at fair value, including the general classification of such instruments pursuant to the fair value hierarchy.

Product/Instrument	Valuation methodology	Classifications in the fair value hierarchy
Securities financing agreements	Valuations are based on discounted cash flows, which consider: • Derivative features: refer to the discussion of derivatives below for further information • Market rates for the respective maturity • Collateral characteristics	Predominantly level 2
Loans and lending-related commitments – wholesale Loans carried at fair value (trading loans and non-trading loans) and associated lending-related commitments	Where observable market data is available, valuations are based on: • Observed market prices (circumstances are infrequent) • Relevant broker quotes • Observed market prices for similar instruments Where observable market data is unavailable or limited, valuations are based on discounted cash flows, which consider the following: • Credit spreads derived from the cost of credit default swaps (“CDS”); or benchmark credit curves developed by the Bank, by industry and credit rating • Prepayment speed • Collateral characteristics	Level 2 or 3
Loans – consumer Loans carried at fair value – conforming residential mortgage loans expected to be sold	Fair value is based on observable market prices for mortgage-backed securities (“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.	Predominantly level 2
Investment and trading securities	Quoted market prices	Level 1
	In the absence of quoted market prices, securities are valued based on: • Observable market prices for similar securities • Relevant broker quotes • Discounted cash flows In addition, the following inputs to discounted cash flows are used for the following products: Mortgage- and asset-backed securities (“ABS”) specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Current market assumptions related to yield, prepayment speed, conditional default rates and loss severity Collateralized loan obligations (“CLOs”) specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Expected prepayment speed, conditional default rates, loss severity • Credit spreads • Credit rating data	Level 2 or 3
Physical commodities	Valued using observable market prices or data.	Level 1 or 2

Product/Instrument	Valuation methodology	Classifications in the fair value hierarchy
Derivatives	Actively traded derivatives, e.g. exchange traded derivatives, that are valued using quoted prices.	Level 1
	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. The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, foreign exchange rates, volatilities, correlations, CDS spreads, recovery rates and prepayment speed. In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows: Interest rate and FX exotic derivatives specific inputs include: • Interest rate curve • Interest rate volatility • Interest rate spread volatility • Bermudan switch value • Interest rate correlation • Interest rate-FX correlation • Foreign exchange correlation Credit derivatives specific inputs include: • Credit correlation between the underlying debt instruments Equity derivatives specific inputs include: • Forward equity price • Equity volatility • Equity correlation • Equity-FX correlation • Equity-IR correlation Commodity derivatives specific inputs include: • Forward commodity price • Commodity volatility • Commodity correlation Additionally, adjustments are made to reflect counterparty credit quality (CVA) and the impact of funding (FVA).	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”)	
	• NAV is supported by the ability to redeem and purchase at the NAV level	Level 1
	• Adjustments to the NAV as required, for restrictions on redemption (e.g., lock-up periods or withdrawal limitations) or where observable activity is limited	Level 2 or 3[(a)]
Beneficial interests issued by consolidated VIEs	Valued using observable market information, where available. In the absence of observable market information, valuations are based on the fair value of the underlying assets held by the VIE.	Level 2 or 3
Structured notes (included in deposits, short-term borrowings and long-term debt)	• Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note. • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion above regarding derivatives valuation. Adjustments are then made to this base valuation to reflect the Bank’s own credit risk (DVA).	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, 2022 and 2021, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

	Fair value hierarchy				
December 31, 2022 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments[e]	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 193,945	$ –	$ –	$ 193,945
Securities borrowed	–	22,454	–	–	22,454
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	6,746	742	–	7,488
Residential – nonagency	–	1,200	4	–	1,204
Commercial – nonagency	–	354	–	–	354
Total mortgage-backed securities	–	8,300	746	–	9,046
U.S. Treasury, GSEs and government agencies[a]	9,402	16	–	–	9,418
Obligations of U.S. states and municipalities	–	4,825	5	–	4,830
Certificates of deposit, bankers' acceptances and commercial paper	–	210	–	–	210
Non-U.S. government debt securities	18,213	48,224	155	–	66,592
Corporate debt securities	–	18,687	201	–	18,888
Loans	–	5,720	687	–	6,407
Asset-backed securities	–	596	1	–	597
Total debt instruments	27,615	86,578	1,795	–	115,988
Equity securities	57,996	1,942	166	–	60,104
Physical commodities[b]	8,454	16,205	–	–	24,659
Other	–	19,416	347	–	19,763
Total debt and equity instruments[c]	94,065	124,141	2,308	–	220,514
Derivative receivables:					
Interest rate	856	354,320	4,089	(331,521)	27,744
Credit	–	9,252	717	(8,885)	1,084
Foreign exchange	169	241,003	1,427	(219,326)	23,273
Equity	–	43,962	8,537	(45,459)	7,040
Commodity	–	34,517	369	(26,121)	8,765
Total derivative receivables	1,025	683,054	15,139	(631,312)	67,906
Total trading assets	95,090	807,195	17,447	(631,312)	288,420
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	3	71,500	–	–	71,503
Residential – nonagency	–	4,620	–	–	4,620
Commercial – nonagency	–	1,958	–	–	1,958
Total mortgage-backed securities	3	78,078	–	–	78,081
U.S. Treasury and government agencies	92,060	–	–	–	92,060
Obligations of U.S. states and municipalities	–	6,758	–	–	6,758
Non-U.S. government debt securities	10,591	9,105	–	–	19,696
Corporate debt securities	–	97	239	–	336
Asset-backed securities:					
Collateralized loan obligations	–	5,792	–	–	5,792
Other	–	3,067	–	–	3,067
Total available-for-sale securities	102,654	102,897	239	–	205,790
Loans	–	40,401	1,394	–	41,795
Mortgage servicing rights	–	–	7,973	–	7,973
Other assets[d]	7,105	5,411	143	–	12,659
Total assets measured at fair value on a recurring basis	$ 204,849	$ 1,172,303	$ 27,196	$ (631,312)	$ 773,036
Deposits	$ –	$ 26,576	$ 2,166	$ –	$ 28,742
Federal funds purchased and securities loaned or sold under repurchase agreements	–	75,327	–	–	75,327
Short-term borrowings	–	6,539	1,257	–	7,796
Trading liabilities:					
Debt and equity instruments[c]	46,832	21,730	76	–	68,638
Derivative payables:					
Interest rate	556	331,488	5,787	(322,378)	15,453
Credit	–	9,409	618	(9,294)	733
Foreign exchange	161	252,605	866	(234,810)	18,822
Equity	–	45,037	7,431	(45,582)	6,886
Commodity	–	30,918	543	(25,364)	6,097
Total derivative payables	717	669,457	15,245	(637,428)	47,991
Total trading liabilities	47,549	691,187	15,321	(637,428)	116,629
Accounts payable and other liabilities	7,084	623	53	–	7,760
Long-term debt	–	15,497	11,648	–	27,145
Total liabilities measured at fair value on a recurring basis	$ 54,633	$ 815,749	$ 30,445	$ (637,428)	$ 263,399

December 31, 2021 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Derivative netting adjustments[e]	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 176,980	$ –	$ –	$ 176,980
Securities borrowed	–	32,112	–	–	32,112
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	5	254	–	259
Residential – nonagency	–	1,055	9	–	1,064
Commercial – nonagency	–	372	1	–	373
Total mortgage-backed securities	$ –	1,432	264	–	1,696
U.S. Treasury, GSEs and government agencies[a]	17,508	123	–	–	17,631
Obligations of U.S. states and municipalities	–	5,330	5	–	5,335
Certificates of deposit, bankers' acceptances and commercial paper	–	243	–	–	243
Non-U.S. government debt securities	26,982	44,572	81	–	71,635
Corporate debt securities	–	17,569	267	–	17,836
Loans	–	7,354	654	–	8,008
Asset-backed securities	–	462	4	–	466
Total debt instruments	44,490	77,085	1,275	–	122,850
Equity securities	61,530	1,582	32	–	63,144
Physical commodities[b]	2,270	20,315	–	–	22,585
Other	–	25,058	602	–	25,660
Total debt and equity instruments[c]	108,290	124,040	1,909	–	234,239
Derivative receivables:					
Interest rate	583	308,872	2,037	(288,891)	22,601
Credit	–	8,601	518	(8,285)	834
Foreign exchange	134	170,015	1,064	(158,614)	12,599
Equity	–	58,946	9,538	(56,699)	11,785
Commodity	–	36,685	349	(25,664)	11,370
Total derivative receivables	717	583,119	13,506	(538,153)	59,189
Total trading assets	109,007	707,159	15,415	(538,153)	293,428
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	4	72,540	–	–	72,544
Residential – nonagency	–	6,070	–	–	6,070
Commercial – nonagency	–	4,949	–	–	4,949
Total mortgage-backed securities	4	83,559	–	–	83,563
U.S. Treasury and government agencies	177,464	–	–	–	177,464
Obligations of U.S. states and municipalities	–	15,727	–	–	15,727
Non-U.S. government debt securities	5,430	10,777	–	–	16,207
Corporate debt securities	–	114	161	–	275
Asset-backed securities:					
Collateralized loan obligations	–	9,662	–	–	9,662
Other	–	5,420	–	–	5,420
Total available-for-sale securities	182,898	125,259	161	–	308,318
Loans	–	56,567	1,904	–	58,471
Mortgage servicing rights	–	–	5,494	–	5,494
Other assets[d]	7,261	3,678	77	–	11,016
Total assets measured at fair value on a recurring basis	$ 299,166	$ 1,101,755	$ 23,051	$ (538,153)	$ 885,819
Deposits	$ –	$ 9,150	$ 2,329	$ –	$ 11,479
Federal funds purchased and securities loaned or sold under repurchase agreements	–	81,545	–	–	81,545
Short-term borrowings	–	9,243	2,376	–	11,619
Trading liabilities:					
Debt and equity instruments[c]	47,578	20,333	29	–	67,940
Derivative payables:					
Interest rate	478	272,398	4,871	(269,940)	7,807
Credit	–	9,639	430	(9,299)	770
Foreign exchange	123	176,896	1,420	(164,570)	13,869
Equity	–	60,279	10,316	(58,749)	11,846
Commodity	–	35,683	1,311	(28,209)	8,785
Total derivative payables	601	554,895	18,348	(530,767)	43,077
Total trading liabilities	48,179	575,228	18,377	(530,767)	111,017
Accounts payable and other liabilities	7,296	1	69	–	7,366
Long-term debt	–	21,708	13,925	–	35,633
Total liabilities measured at fair value on a recurring basis	$ 55,475	$ 696,875	$ 37,076	$ (530,767)	$ 258,659

(a) At December 31, 2022 and 2021, included total U.S. GSE obligations of $27.7 billion and $46.1 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, 2022 and 2021 the fair values of these investments, which include certain hedge funds, private equity funds, real estate and other funds, were $8 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 14-17 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 the weighted or arithmetic averages of such inputs. While the determination to classify an instrument within level 3 is based on the significance of the unobservable inputs to the overall fair value measurement, level 3 financial instruments typically include observable components (that is, components that are actively quoted and can be validated to external sources) in addition to the unobservable components. The level 1 and/or level 2 inputs are not included in the table. In addition, the 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, weighted and arithmetic average values 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.

Level 3 inputs[(a)]

December 31, 2022						
Product/Instrument	**Fair value (in millions)**	**Principal valuation technique**	**Unobservable inputs[(g)]**	**Range of input values**		**Average[(i)]**
Residential mortgage-backed securities and loans[(b)]	$ 1,635	Discounted cash flows	Yield	5%	15%	7%
			Prepayment speed	3%	11%	8%
			Conditional default rate	0%	5%	0%
			Loss severity	0%	110%	3%
Commercial mortgage-backed securities and loans[(c)]	388	Market comparables	Price	$0	$95	$84
Corporate debt securities	440	Market comparables	Price	$0	$243	$95
Loans[(d)]	804	Market comparables	Price	$0	$145	$77
Non-U.S. government debt securities	155	Market comparables	Price	$6	$100	$84
Net interest rate derivatives	(1,664)	Option pricing	Interest rate volatility	28bps	674bps	143bps
			Interest rate spread volatility	23bps	35bps	26bps
			Bermudan switch value	0%	57%	18%
			Interest rate correlation	(82)%	89%	16%
			IR-FX correlation	(35)%	60%	7%
	(34)	Discounted cash flows	Prepayment speed	0%	21%	7%
Net credit derivatives	77	Discounted cash flows	Credit correlation	30%	60%	43%
			Credit spread	1bps	12,107bps	1,057bps
			Recovery rate	10%	67%	45%
	22	Market comparables	Price	$15	$115	$82
Net foreign exchange derivatives	649	Option pricing	IR-FX correlation	(40)%	60%	21%
	(88)	Discounted cash flows	Prepayment speed	9%		9%
			Interest rate curve	2%	29%	8%
Net equity derivatives	1,106	Option pricing	Forward equity price[(h)]	84%	144%	100%
			Equity volatility	4%	137%	36%
			Equity correlation	17%	100%	56%
			Equity-FX correlation	(86)%	60%	(29)%
			Equity-IR correlation	(5)%	50%	19%
Net commodity derivatives	(174)	Option pricing	Oil commodity forward	$72 / BBL	$251 / BBL	$162 / BBL
			Natural gas commodity forward	$1 / MMBTU	$24 / MMBTU	$13 / MMBTU
			Commodity volatility	4%	154%	79%
			Commodity correlation	(45)%	77%	16%
MSRs	7,973	Discounted cash flows	Refer to Note 16			
Long-term debt, short-term borrowings, and deposits[(e)]	13,999	Option pricing	Interest rate volatility	28bps	674bps	143bps
			Bermudan switch value	0%	57%	18%
			Interest rate correlation	(82)%	89%	16%
			IR-FX correlation	(35)%	60%	7%
			Equity correlation	17%	100%	56%
			Equity-FX correlation	(86)%	60%	(29)%
			Equity-IR correlation	(5)%	50%	19%
	1,072	Discounted cash flows	Credit correlation	30%	60%	43%
Other level 3 assets and liabilities, net[(f)]	533					

(a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated balance sheets. Furthermore, the inputs presented for each valuation technique in the table are, in some cases, not applicable to every instrument valued using the technique as the characteristics of the instruments can differ.
(b) Comprises U.S. GSE and government agency securities of $742 million, nonagency securities of $4 million and non-trading loans of $889 million.
(c) Comprises trading loans of $40 million and non-trading loans of $348 million.
(d) Comprises trading loans of $647 million and non-trading loans of $157 million.
(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 other equity instruments of $330 million with level 3 inputs comparable to net equity derivatives. All other level 3 assets and liabilities are insignificant both individually and in aggregate.
(g) Price is a significant unobservable input for certain instruments. When quoted market prices are not readily available, reliance is generally placed on price-based internal valuation techniques. The price input is expressed assuming a par value of $100.
(h) Forward equity price is expressed as a percentage of the current equity price.
(i) Amounts represent weighted averages except for derivative-related inputs where arithmetic averages are used.

Changes in and ranges of unobservable inputs

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

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

Bermudan switch value – The switch value is the difference between the overall value of a Bermudan swaption, which can be exercised at multiple points in time, and its most expensive European swaption and reflects the additional value that the multiple exercise dates provide the holder. Switch values are dependent on market conditions and can vary greatly depending on a number of factors, such as the tenor of the underlying swap as well as the strike price of the option. An increase in switch value, in isolation, would generally result in an increase in a fair value measurement.

Interest rate curve – represents the relationship of interest rates over differing tenors. The interest rate curve is used to set interest rate and foreign exchange derivative cash flows and is also a pricing input used in the discounting of any derivative cash flow.

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

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

Changes in level 3 recurring fair value measurements

The following tables include a rollforward of the Consolidated balance sheets amounts (including changes in fair value) for financial instruments classified by the Bank within level 3 of the fair value hierarchy for the years ended December 31, 2022, 2021 and 2020. 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.

	Fair value measurements using significant unobservable inputs								
Year ended December 31, 2022 (in millions)	Fair value at January 1, 2022	Total realized/ unrealized gains/ (losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2022	Change in unrealized gains/ (losses) related to financial instruments held at Dec. 31, 2022
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 254	$ 29	$ 643	$ (102)	$ (82)	$ –	$ –	$ 742	$ 29
Residential – nonagency	9	(1)	–	–	–	–	(4)	4	–
Commercial – nonagency	1	–	–	–	–	2	(3)	–	–
Total mortgage-backed securities	264	28	643	(102)	(82)	2	(7)	746	29
Obligations of U.S. states and municipalities	5	–	–	–	–	–	–	5	–
Non-U.S. government debt securities	81	(92)	494	(338)	(4)	84	(70)	155	(145)
Corporate debt securities	267	(24)	126	(170)	(61)	147	(84)	201	(48)
Loans	654	(38)	596	(582)	(228)	920	(635)	687	(11)
Asset-backed securities	4	–	–	–	–	1	(4)	1	–
Total debt instruments	1,275	(126)	1,859	(1,192)	(375)	1,154	(800)	1,795	(175)
Equity securities	32	(835)	357	(270)	–	923	(41)	166	(652)
Other	602	(47)	702	–	(902)	3	(11)	347	(85)
Total trading assets – debt and equity instruments	1,909	(1,008) [c]	2,918	(1,462)	(1,277)	2,080	(852)	2,308	(912) [c]
Net derivative receivables:[b]									
Interest rate	(2,834)	1,142	311	(967)	306	718	(374)	(1,698)	1,155
Credit	88	225	16	(10)	(196)	6	(30)	99	170
Foreign exchange	(356)	773	214	(175)	98	3	4	561	495
Equity	(778)	2,530	2,933	(3,210)	(23)	343	(689)	1,106	1,628
Commodity	(962)	756	114	(331)	242	7	–	(174)	555
Total net derivative receivables	(4,842)	5,426 [c]	3,588	(4,693)	427	1,077	(1,089)	(106)	4,003 [c]
Available-for-sale securities:									
Mortgage-backed securities	–	–	–	–	–	–	–	–	–
Corporate debt securities	161	5	88	–	(15)	–	–	239	5
Total available-for-sale securities	161	5 [d]	88	–	(15)	–	–	239	5 [d]
Loans	1,904	(108) [c]	454	(261)	(818)	1,053	(830)	1,394	(76) [c]
Mortgage servicing rights	5,494	2,039 [e]	2,198	(822)	(936)	–	–	7,973	2,039 [e]
Other assets	77	68 [c]	–	–	(2)	–	–	143	68 [c]

	Fair value measurements using significant unobservable inputs									
Year ended December 31, 2022 (in millions)	Fair value at January 1, 2022	Total realized/ unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2022	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2022
Liabilities:[a]										
Deposits	$ 2,329	$ (296) [c][f]	$ –	$ –	$ 531	$ (115)	$ –	$ (283)	$ 2,166	$ (76) [c][f]
Short-term borrowings	2,376	(461) [c][f]	–	–	3,859	(4,519)	16	(14)	1,257	86 [c][f]
Trading liabilities – debt and equity instruments	29	(45) [c]	(22)	69	–	–	52	(7)	76	76 [c]
Accounts payable and other liabilities	69	(16) [c]	–	–	–	–	–	–	53	(16) [c]
Long-term debt	13,925	(1,696) [c][f]	–	–	5,283	(5,836)	549	(577)	11,648	(1,360) [c][f]

Year ended December 31, 2021 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2021
	Fair value at January 1, 2021	Total realized/unrealized gains/(losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2021	
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 387	$ (28)	$ –	$ –	$ (105)	$ –	$ –	$ 254	$ (28)
Residential – nonagency	13	(1)	–	(2)	–	–	(1)	9	(1)
Commercial – nonagency	1	–	–	–	–	–	–	1	–
Total mortgage-backed securities	401	(29)	–	(2)	(105)	–	(1)	264	(29)
Obligations of U.S. states and municipalities	5	–	–	–	–	–	–	5	–
Non-U.S. government debt securities	182	(14)	359	(332)	(7)	–	(107)	81	(10)
Corporate debt securities	441	(33)	390	(485)	(4)	152	(194)	267	(15)
Loans	874	18	935	(669)	(259)	629	(874)	654	5
Asset-backed securities	3	19	35	(55)	–	2	–	4	(1)
Total debt instruments	1,906	(39)	1,719	(1,543)	(375)	783	(1,176)	1,275	(50)
Equity securities	124	(17)	42	(181)	–	120	(56)	32	(66)
Other	344	79	1,067	–	(814)	27	(101)	602	43
Total trading assets – debt and equity instruments	2,374	23 (c)	2,828	(1,724)	(1,189)	930	(1,333)	1,909	(73) (c)
Net derivative receivables:[b]									
Interest rate	(2,509)	1,947	194	(718)	(1,773)	113	(88)	(2,834)	615
Credit	(205)	129	6	(12)	142	34	(6)	88	140
Foreign exchange	(372)	(252)	112	(123)	273	(20)	26	(356)	1
Equity	(1,175)	2,815	3,418	(7,562)	996	446	284	(778)	2,400
Commodity	(770)	(669)	148	(495)	840	3	(19)	(962)	(445)
Total net derivative receivables	(5,031)	3,970 (c)	3,878	(8,910)	478	576	197	(4,842)	2,711 (c)
Available-for-sale securities:									
Mortgage-backed securities	–	–	–	–	–	–	–	–	–
Corporate debt securities	–	(1)	162	–	–	–	–	161	(1)
Total available-for-sale securities	–	(1) (d)	162	–	–	–	–	161	(1) (d)
Loans	2,274	(89) (c)	552	(437)	(903)	1,298	(791)	1,904	(59) (c)
Mortgage servicing rights	3,276	98 (e)	3,022	(114)	(788)	–	–	5,494	98 (e)
Other assets	57	20 (c)	–	–	–	–	–	77	19 (c)

Year ended December 31, 2021 (in millions)	Fair value measurements using significant unobservable inputs									Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2021
	Fair value at January 1, 2021	Total realized/unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2021	
Liabilities:[a]										
Deposits	$ 2,948	$ (77) (c)(f)	$ –	$ –	$ 432	$ (487)	$ 2	$ (489)	$ 2,329	$ (73) (c)(f)
Short-term borrowings	2,314	(1,430) (c)(f)	–	–	6,665	(5,108)	9	(74)	2,376	(97) (c)(f)
Trading liabilities – debt and equity instruments	49	(7) (c)	(97)	32	–	–	63	(11)	29	(184) (c)
Accounts payable and other liabilities	60	9 (c)	–	–	–	–	–	–	69	9 (c)
Long-term debt	14,397	(52) (c)(f)	–	–	7,569	(7,443)	79	(625)	13,925	37 (c)(f)

	Fair value measurements using significant unobservable inputs								
Year ended December 31, 2020 (in millions)	Fair value at January 1, 2020	Total realized/ unrealized gains/ (losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2020	Change in unrealized gains/ (losses) related to financial instruments held at Dec. 31, 2020
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 708	$ (147)	$ –	$ (136)	$ (38)	$ –	$ –	$ 387	$ (141)
Residential – nonagency	14	–	–	–	(1)	–	–	13	–
Commercial – nonagency	1	–	–	–	–	–	–	1	–
Total mortgage-backed securities	723	(147)	–	(136)	(39)	–	–	401	(141)
Obligations of U.S. states and municipalities	6	–	–	(1)	–	–	–	5	–
Non-U.S. government debt securities	155	21	281	(245)	(7)	–	(23)	182	11
Corporate debt securities	531	50	516	(210)	(290)	402	(558)	441	(22)
Loans	646	(60)	981	(471)	(68)	790	(944)	874	(35)
Asset-backed securities	6	(2)	4	(4)	(1)	–	–	3	–
Total debt instruments	2,067	(138)	1,782	(1,067)	(405)	1,192	(1,525)	1,906	(187)
Equity securities	96	100	10	(427)	–	479	(134)	124	(6)
Other	268	320	654	(521)	(404)	62	(35)	344	78
Total trading assets – debt and equity instruments	2,431	282 [c]	2,446	(2,015)	(809)	1,733	(1,694)	2,374	(115) [c]
Net derivative receivables:[b]									
Interest rate	(1,274)	2,356	308	(1,634)	(2,193)	(380)	308	(2,509)	12
Credit	(115)	(207)	71	(154)	173	59	(32)	(205)	(120)
Foreign exchange	(960)	173	48	(37)	226	13	165	(372)	103
Equity	(1,485)	362	3,782	(2,644)	(991)	(528)	329	(1,175)	(996)
Commodity	(69)	(545)	34	(244)	335	(299)	18	(770)	262
Total net derivative receivables	(3,903)	2,139 [c]	4,243	(4,713)	(2,450)	(1,135)	788	(5,031)	(739) [c]
Available-for-sale securities:									
Mortgage-backed securities	1	–	–	–	(1)	–	–	–	–
Corporate debt securities	–	–	–	–	–	–	–	–	–
Total available-for-sale securities	1	–	–	–	(1)	–	–	–	–
Loans	498	(353) [c]	891	(82)	(547)	2,554	(687)	2,274	(17) [c]
Mortgage servicing rights	4,699	(1,540) [e]	1,192	(176)	(899)	–	–	3,276	(1,540) [e]
Other assets	49	20 [c]	2	–	(14)	–	–	57	23 [c]

	Fair value measurements using significant unobservable inputs									
Year ended December 31, 2020 (in millions)	Fair value at January 1, 2020	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2020	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2020
Liabilities:[a]										
Deposits	$ 3,372	$ 163 [c][f]	$ –	$ –	$ 648	$ (560)	$ 268	$ (943)	$ 2,948	$ 324 [c][f]
Short-term borrowings	1,516	(180) [c][f]	–	–	5,118	(4,167)	81	(54)	2,314	93 [c][f]
Trading liabilities – debt and equity instruments	38	(17) [c]	(154)	10	–	(1)	179	(6)	49	(3) [c]
Accounts payable and other liabilities	19	41 [c]	–	–	–	–	–	–	60	41 [c]
Long-term debt	15,368	11 [c][f]	(1)	–	5,910	(6,644)	802	(1,049)	14,397	1,223 [c][f]

(a) Level 3 assets at fair value as a percentage of total Bank assets at fair value (including assets measured at fair value on a nonrecurring basis) were 4%, 3% and 2% at December 31, 2022, 2021 and 2020, respectively. Level 3 liabilities at fair value as a percentage of total Bank liabilities at fair value (including liabilities measured at fair value on a nonrecurring basis) were 12%, 14% and 13% at December 31, 2022, 2021 and 2020, respectively.
(b) All level 3 derivatives are presented on a net basis, irrespective of the 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) Realized gains/(losses) on AFS securities are reported in investment securities gains/(losses). Unrealized gains/(losses) are reported in OCI. Realized and unrealized gains/(losses) recorded on AFS securities were not material for the years ended December 31, 2022, 2021 and 2020.
(e) Changes in fair value for MSRs are reported in mortgage fees and related income.
(f) Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue, and were not material for the years ended December 31, 2022, 2021 and 2020. Unrealized (gains)/losses are reported in OCI, and they were $(143) million and $235 million for the years ended December 31, 2022 and 2021, respectively, and were not material for the year ended December 31, 2020.
(g) Loan originations are included in purchases.
(h) Includes financial assets and liabilities that have matured, been partially or fully repaid, impacts of modifications, deconsolidations associated with beneficial interests in VIEs and other items.

Level 3 analysis

Consolidated balance sheets changes

The following describes significant changes to level 3 assets since December 31, 2021, 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 29 for further information on changes impacting items measured at fair value on a nonrecurring basis.

For the year ended December 31, 2022

Level 3 assets were $27.2 billion at December 31, 2022, reflecting an increase of $4.1 billion from December 31, 2021 driven by:

- $1.6 billion increase in gross derivative receivables due to gains and purchases largely offset by settlements.
- $2.5 billion increase in MSRs.

Refer to Note 16 for information on MSRs.

Refer to the sections below for additional information.

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

During the year ended December 31, 2022, significant transfers from level 2 into level 3 included the following:

- $2.1 billion of total debt and equity instruments, predominantly due to equity securities of $923 million driven by a decrease in observability as a result of restricted access to certain markets and trading loans of $920 million driven by a decrease in observability.
- $1.6 billion of gross interest rate derivative receivables and $909 million of gross interest rate derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $3.0 billion of gross equity derivative receivables and $2.6 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.1 billion of non-trading loans driven by a decrease in observability.

During the year ended December 31, 2022, significant transfers from level 3 into level 2 included the following:

- $852 million of total debt and equity instruments, largely due to trading loans, driven by an increase in observability.
- $1.2 billion of gross interest rate derivative receivables and $811 million of gross interest rate derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $3.6 billion of gross equity derivative receivables and $2.9 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $830 million of non-trading loans driven by an increase in observability.

During the year ended December 31, 2021, significant transfers from level 2 into level 3 included the following:

- $930 million of total debt and equity instruments, largely due to trading loans, driven by a decrease in observability.
- $2.2 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.
- $1.3 billion of non-trading loans driven by a decrease in observability.

During the year ended December 31, 2021, significant transfers from level 3 into level 2 included the following:

- $1.3 billion of total debt and equity instruments, largely due to trading loans, driven by an increase in observability.
- $2.9 billion of gross equity derivative receivables and $3.2 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $791 million of non-trading loans driven by an increase in observability.

During the year ended December 31, 2020, significant transfers from level 2 into level 3 included the following:

- $1.7 billion of total debt and equity instruments, largely due to equity securities and trading loans, driven by a decrease in observability.
- $4.6 billion of gross equity derivative receivables and $5.2 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $2.6 billion of non-trading loans driven by a decrease in observability.

During the year ended December 31, 2020, significant transfers from level 3 into level 2 included the following:

- $1.7 billion of total debt and equity instruments, predominantly corporate debt and trading loans, driven by an increase in observability.
- $3.8 billion of gross equity derivative receivables and $4.1 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.

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

Gains and losses

The following describes significant components of total realized/unrealized gains/(losses) for instruments measured at fair value on a recurring basis for the years ended December 31, 2022, 2021 and 2020.

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 23-27 for further information on these instruments.

2022

- $6.4 billion of net gains on assets, largely driven by gains in net equity derivative receivables due to market movements and gains in MSRs reflecting lower prepayment speeds on higher rates.
- $2.5 billion of net gains on liabilities, largely driven by a decline in the fair value of long-term debt due to market movements.

2021

- $4.0 billion of net gains on assets, driven by gains in net interest rate derivative receivables and net equity derivative receivables due to market movements.
- $1.6 billion of net gains on liabilities, predominantly driven by gains in short-term borrowings due to market movements.

2020

- $548 million of net gains on assets, driven by gains in net interest rate derivative receivables due to market movements partially offset by losses in MSRs reflecting faster prepayment speeds on lower rates.

Refer to Note 16 for additional information on MSRs.

Assets and liabilities measured at fair value on a nonrecurring basis

The following tables present the assets and liabilities held as of December 31, 2022 and 2021, for which nonrecurring fair value adjustments were recorded during the years ended December 31, 2022 and 2021, by major product category and fair value hierarchy.

December 31, 2022 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Total fair value
Loans	**$ –**	**$ 630**	**$ 450** [b]	**$ 1,080**
Other assets[a]	**–**	**36**	**535**	**571**
Total assets measured at fair value on a nonrecurring basis	**$ –**	**$ 666**	**$ 985**	**$ 1,651**
Accounts payable and other liabilities	**–**	**–**	**84**	**84**
Total liabilities measured at fair value on a nonrecurring basis	**$ –**	**$ –**	**$ 84**	**$ 84**

December 31, 2021 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Total fair value
Loans	$ –	$ 1,006	$ 660	$ 1,666
Other assets	–	4	83	87
Total assets measured at fair value on a nonrecurring basis	$ –	$ 1,010	$ 743	$ 1,753
Accounts payable and other liabilities	$ –	–	3	3
Total liabilities measured at fair value on a nonrecurring basis	$ –	–	3	3

(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 $535 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2022, $400 million related to equity securities adjusted based on the measurement alternative. These equity securities are classified as level 3 due to the infrequency of the observable prices and/or the restrictions on the shares.

(b) Of the $450 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2022, $83 million related to residential real estate loans carried at the net realizable value of the underlying collateral (e.g., collateral-dependent loans). These amounts are classified as level 3 as they are valued using information from broker's price opinions, appraisals and automated valuation models and discounted based upon the Bank's experience with actual liquidation values. These discounts ranged from 9% to 56% with a weighted average of 23%.

Nonrecurring fair value changes

The following table presents the total change in value of assets and liabilities for which fair value adjustments have been recognized for the years ended December 31, 2022, 2021 and 2020, related to assets and liabilities held at those dates.

December 31, (in millions)	2022	2021	2020
Loans	**$ (57)**	$ (48)	$ (393)
Other assets[a]	**(4)**	(36)	(45)
Accounts payable and other liabilities	**(83)**	5	(11)
Total nonrecurring fair value gains/(losses)	**$ (144)**	$ (79)	$ (449)

(a) Included $62 million for the year ended December 31, 2022, of net gains/(losses) as a result of the measurement alternative, and were not material for the years ended December 31, 2021 and 2020.

Refer to Note 13 for further information about the measurement of collateral-dependent loans.

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 (i.e., measurement alternative), 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, 2022 and 2021, 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)	2022	2021
Other assets		
Carrying value[(a)]	**$ 639**	$ 575
Upward carrying value changes[(b)]	**63**	1
Downward carrying value changes/impairment[(c)]	**(1)**	(1)

(a) The period-end carrying values reflect cumulative purchases and sales in addition to upward and downward carrying value changes.
(b) The cumulative upward carrying value changes between January 1, 2018 and December 31, 2022 were $403 million.
(c) The cumulative downward carrying value changes/impairment between January 1, 2018 and December 31, 2022 were $(21) million.

Included in other assets above is the Bank's interest in Visa Class B common shares ("Visa B shares") recorded at a nominal carrying value. In November 2022, the Bank sold approximately 3 million Visa B shares, resulting in a net pretax gain of $914 million recorded in other income. Visa B shares are subject to certain transfer restrictions and are convertible into Visa Class A common shares ("Visa A shares") at a specified conversion rate upon final resolution of certain litigation matters involving Visa. In connection with the sale, and consistent with the Bank's sale of 20 million Visa B shares in 2013, the Bank entered into a derivative instrument with the purchaser of the shares, under which the Bank retains the risk associated with changes in the conversion rate.

Under the terms of the derivative instrument, the Bank will (a) make or receive payments based on subsequent changes in the conversion rate and (b) make periodic interest payments to the purchaser of the Visa B shares. The payments under the derivative continue as long as the Visa B shares remain subject to transfer restrictions. The derivative is accounted for at fair value using a discounted cash flow methodology based upon the Bank's estimate of the timing and magnitude of final resolution of the litigation matters. The derivative is recorded in trading liabilities and changes in fair value are recognized in other income. As of December 31, 2022, the Bank held derivative instruments associated with the 23 million Visa B shares that it has sold, which are all subject to similar terms and conditions.

As of December 31, 2022, the Bank's remaining interest in Visa B shares was approximately 37 million shares. On January 5, 2023, Visa filed a Current Report on Form 8-K with the SEC indicating that the conversion rate of Visa B shares to Visa A shares decreased from 1.6059 to 1.5991 effective December 29, 2022. The conversion rate may be further adjusted by Visa depending on developments related to the litigation matters. The outcome of those litigation matters, and the effect that the resolution of those matters may have on the conversion rate, is unknown, and accordingly, as of December 31, 2022, there is significant uncertainty regarding the date of the termination of transfer restrictions and the value of the final conversion rate. As a result of this, as well as differences in voting rights, Visa B shares are not considered to be similar to Visa A shares, and they continue to be held at their nominal carrying value.

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, 2022 and 2021, 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.

	December 31, 2022					December 31, 2021				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value
Financial assets										
Cash and due from banks	**$ 27.3**	**$ 27.3**	**$ –**	**$ –**	**$ 27.3**	$ 25.7	$ 25.7	$ –	$ –	$ 25.7
Deposits with banks	**538.7**	**538.5**	**0.2**	**–**	**538.7**	713.7	713.4 (b)	0.3 (b)	–	713.7
Accrued interest and accounts receivable	**89.0**	**–**	**88.9**	**0.1**	**89.0**	75.9	–	75.8	0.1	75.9
Federal funds sold and securities purchased under resale agreements	**65.5**	**–**	**65.5**	**–**	**65.5**	50.5	–	50.5	–	50.5
Securities borrowed	**31.2**	**–**	**31.2**	**–**	**31.2**	33.0	–	33.0	–	33.0
Investment securities, held-to-maturity	**425.3**	**189.1**	**199.5**	**–**	**388.6**	363.7	183.3	179.3	–	362.6
Loans, net of allowance for loan losses(a)	**1,071.5**	**–**	**191.0**	**851.7**	**1,042.7**	1,000.3	–	199.7	818.8	1,018.5
Other	**63.5**	**–**	**62.4**	**1.1**	**63.5**	47.0	–	45.8	1.3	47.1
Financial liabilities										
Deposits	**$ 2,412.0**	**$ –**	**$ 2,411.9**	**$ –**	**$ 2,411.9**	$ 2,538.1	$ –	$ 2,538.1	$ –	$ 2,538.1
Federal funds purchased and securities loaned or sold under repurchase agreements	**10.6**	**–**	**10.6**	**–**	**10.6**	20.7	–	20.7	–	20.7
Short-term borrowings	**2.3**	**–**	**2.3**	**–**	**2.3**	1.8	–	1.8	–	1.8
Accounts payable and other liabilities	**120.1**	**–**	**113.9**	**5.5**	**119.4**	97.1	–	91.9	4.6	96.5
Beneficial interests issued by consolidated VIEs	**13.4**	**–**	**13.4**	**–**	**13.4**	10.7	–	10.7	–	10.7
Long-term debt	**48.0**	**–**	**45.1**	**2.8**	**47.9**	48.3	–	45.3	3.1	48.4

(a) Fair value is typically estimated using a discounted cash flow model that incorporates the characteristics of the underlying loans (including principal, contractual interest rate and contractual fees) and other key inputs, including expected lifetime credit losses, interest rates, prepayment rates, and primary origination or secondary market spreads. For certain loans, the fair value is measured based on the value of the underlying collateral. Carrying value of the loan takes into account the loan's allowance for loan losses, which represents the loan's expected credit losses over its remaining expected life. The difference between the estimated fair value and carrying value of a loan is generally attributable to changes in market interest rates, including credit spreads, market liquidity premiums and other factors that affect the fair value of a loan but do not affect its carrying value.
(b) Prior-period amounts have been revised to conform with the current presentation.

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 and the estimated fair value of these wholesale lending-related commitments were as follows for the periods indicated.

	December 31, 2022					December 31, 2021				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value(a)(b)	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value(a)(b)	Level 1	Level 2	Level 3	Total estimated fair value
Wholesale lending-related commitments	**$ 2.3**	**$ –**	**$ –**	**$ 3.1**	**$ 3.1**	$ 2.1	$ –	$ –	$ 2.9	$ 2.9

(a) Excludes the current carrying values of the guarantee liability and the offsetting asset, each of which is recognized at fair value at the inception of the guarantees.
(b) Includes the wholesale allowance for lending-related commitments.

The Bank does not estimate the fair value of consumer off-balance sheet 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 16 of this Note for a further discussion of the valuation of lending-related commitments.

Note 4 – Fair value option

The fair value option provides an option to elect fair value 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
- Owned beneficial interests in securitized financial assets that contain embedded credit derivatives, which would otherwise be required to be separately accounted for as a derivative instrument
- Structured notes and other hybrid instruments, which are predominantly financial instruments that contain embedded derivatives, that are issued or transacted as part of client-driven activities
- Certain long-term beneficial interests issued by 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, 2022, 2021 and 2020, 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.

	2022			2021			2020		
December 31, (in millions)	Principal transactions	All other income	Total changes in fair value recorded[e]	Principal transactions	All other income	Total changes in fair value recorded[e]	Principal transactions	All other income	Total changes in fair value recorded[e]
Federal funds sold and securities purchased under resale agreements	**$ (209)**	**$ –**	**$ (209)**	$ (70)	$ –	$ (70)	$ 51	$ –	$ 51
Securities borrowed	**(497)**	**–**	**(497)**	(200)	–	(200)	130	–	130
Trading assets:									
Debt and equity instruments, excluding loans	**(2,009)**	**–**	**(2,009)**	(2,189)	(1) [c]	(2,190)	2,420	1 [c]	2,421
Loans reported as trading assets:									
Changes in instrument-specific credit risk	**(137)**	**–**	**(137)**	361	–	361	126	–	126
Other changes in fair value	**(59)**	**–**	**(59)**	(1)	–	(1)	–	–	–
Loans:									
Changes in instrument-specific credit risk	**(243)**	**21 [c]**	**(222)**	586	(7) [c]	579	184	7 [c]	191
Other changes in fair value	**(1,338)**	**(794) [c]**	**(2,132)**	(162)	2,056 [c]	1,894	471	3,239 [c]	3,710
Other assets	**1**	**–**	**1**	5	(1) [d]	4	(6)	–	(6)
Deposits[a]	**908**	**–**	**908**	(211)	–	(211)	(747)	–	(747)
Federal funds purchased and securities loaned or sold under repurchase agreements	**570**	**–**	**570**	184	–	184	(98)	–	(98)
Short-term borrowings[a]	**1,226**	**–**	**1,226**	(386)	–	(386)	(272)	–	(272)
Trading liabilities	**(1)**	**–**	**(1)**	1	–	1	2	–	2
Beneficial interests issued by consolidated VIEs	**–**	**–**	**–**	–	–	–	–	–	–
Other liabilities	**(11)**	**–**	**(11)**	(17)	–	(17)	(52)	–	(52)
Long-term debt[a][b]	**2,494**	**103 [c][d]**	**2,597**	(1,167)	4 [c][d]	(1,163)	(1,317)	(1) [c]	(1,318)

(a) Unrealized gains/(losses) due to instrument-specific credit risk (DVA) for liabilities for which the fair value option has been elected are recorded in OCI while realized gains/(losses) are recorded in principal transactions revenue. Realized gains/(losses) due to instrument-specific credit risk recorded in principal transactions revenue were not material for the years ended December 31, 2022, 2021 and 2020.
(b) Long-term debt measured at fair value predominantly relates to structured notes. Although the risk associated with the structured notes is actively managed, the gains/(losses) reported in this table do not include the income statement impact of the risk management instruments used to manage such risk.
(c) Reported in mortgage fees and related income.
(d) Reported in other income.
(e) Changes in fair value exclude contractual interest, which is included in interest income and interest expense for all instruments other than certain hybrid financial instruments. Refer to Note 8 for further information regarding interest income and interest expense.

Determination of instrument-specific credit risk for items for which the fair value option was elected

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

- Loans and lending-related commitments: For floating-rate instruments, all changes in value are attributed to instrument-specific credit risk. For fixed-rate instruments, an allocation of the changes in value for the period is made between those changes in value that are interest rate-related and changes in value that are credit-related. Allocations are generally based on an analysis of borrower-specific credit spread and recovery information, where available, or benchmarking to similar entities or industries.
- Long-term debt: Changes in value attributable to instrument-specific credit risk were derived principally from observable changes in the 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, 2022 and 2021, for loans, long-term debt and long-term beneficial interests for which the fair value option has been elected.

	2022			2021		
December 31, (in millions)	Contractual principal outstanding	Fair value	Fair value over/(under) contractual principal outstanding	Contractual principal outstanding	Fair value	Fair value over/(under) contractual principal outstanding
Loans						
Nonaccrual loans						
Loans reported as trading assets	**$ 1,890**	**$ 297**	**$ (1,593)**	$ 2,264	$ 518	$ (1,746)
Loans	**881**	**826**	**(55)**	909	794	(115)
Subtotal	**2,771**	**1,123**	**(1,648)**	3,173	1,312	(1,861)
90 or more days past due and government guaranteed						
Loans[a]	**202**	**115**	**(87)**	293	280	(13)
All other performing loans[b]						
Loans reported as trading assets	**7,365**	**6,110**	**(1,255)**	7,795 [e]	7,490	(305) [e]
Loans	**42,272**	**40,854**	**(1,418)**	57,159 [e]	57,397	238 [e]
Subtotal	**49,637**	**46,964**	**(2,673)**	64,954	64,887	(67)
Total loans	**$ 52,610**	**$ 48,202**	**$ (4,408)**	$ 68,420	$ 66,479	$ (1,941)
Long-term debt						
Principal-protected debt	**$ 6,364 [d]**	**$ 5,900**	**$ (464)**	$ 7,811 [d]	$ 7,954	$ 143
Nonprincipal-protected debt[c]	**NA**	**21,245**	**NA**	NA	27,679	NA
Total long-term debt	**NA**	**$ 27,145**	**NA**	NA	$ 35,633	NA

(a) These balances are excluded from nonaccrual loans as the loans are insured and/or guaranteed by U.S. government agencies.
(b) There were no performing loans that were ninety days or more past due as of December 31, 2022 and 2021.
(c) 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.
(d) 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.
(e) Prior-period amounts have been revised to conform with the current presentation.

At December 31, 2022 and 2021, the contractual amount of lending-related commitments for which the fair value option was elected was $7.4 billion and $11.7 billion, respectively, with a corresponding fair value of $24 million and $10 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 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.

The table below presents both on–balance sheet and off–balance sheet consumer and wholesale credit exposure by the Bank's three credit portfolio segments as of December 31, 2022 and 2021. The wholesale industry of risk category is generally based on the client or counterparty's primary business activity.

	2022				2021			
		On-balance sheet				On-balance sheet		
December 31, (in millions)	Credit exposure(h)	Loans	Derivatives	Off-balance sheet(j)	Credit exposure(h)	Loans	Derivatives	Off-balance sheet(j)
Consumer, excluding credit card	**$ 344,861**	**$ 311,343** (i)	**$ –**	**$ 33,518**	$ 368,600	$ 323,266 (i)	$ –	$ 45,334
Credit card(a)	**1,006,459**	**185,175**	**–**	**821,284**	884,830	154,296	–	730,534
Total consumer(a)	**1,351,320**	**496,518**	**–**	**854,802**	1,253,430	477,562	–	775,868
Wholesale(b)								
Real Estate	**170,857**	**131,681**	**249**	**38,927**	155,019	119,735	1,113	34,171
Individuals and Individual Entities(c)	**129,987**	**119,597**	**433**	**9,957**	141,096	129,760	1,317	10,019
Consumer & Retail	**120,551**	**45,865**	**1,647**	**73,039**	122,588	39,577	2,669	80,342
Asset Managers	**91,952**	**39,970**	**14,065**	**37,917**	78,945	40,498	9,116	29,331
Industrials	**72,479**	**26,955**	**1,770**	**43,754**	66,970	21,648	1,224	44,098
Technology, Media & Telecommunications	**71,996**	**21,622**	**2,950**	**47,424**	82,838	17,815	2,640	62,383
Healthcare	**62,449**	**22,919**	**1,648**	**37,882**	58,819	18,508	2,524	37,787
Banks & Finance Cos	**51,770**	**32,248**	**3,104**	**16,418**	57,311	34,275	6,974	16,062
Oil & Gas	**38,667**	**9,633**	**5,118**	**23,916**	42,576	11,013	6,030	25,533
Utilities	**35,867**	**8,975**	**3,114**	**23,778**	33,080	5,904	3,679	23,497
State & Municipal Govt(d)	**33,650**	**17,954**	**582**	**15,114**	32,937	15,046	1,559	16,332
Automotive	**33,287**	**14,735**	**529**	**18,023**	34,573	11,759	719	22,095
Insurance	**20,823**	**2,387**	**7,859**	**10,577**	13,925	1,303	2,700	9,922
Chemicals & Plastics	**19,946**	**5,766**	**398**	**13,782**	17,585	5,012	564	12,009
Central Govt	**19,078**	**3,167**	**12,938**	**2,973**	11,314	2,889	6,834	1,591
Metals & Mining	**15,903**	**5,398**	**462**	**10,043**	16,644	5,696	872	10,076
Transportation	**15,004**	**4,999**	**567**	**9,438**	14,629	5,447	782	8,400
Securities Firms	**6,037**	**406**	**3,371**	**2,260**	3,953	378	1,248	2,327
Financial Markets Infrastructure	**4,942**	**13**	**3,030**	**1,899**	4,352	5	2,462	1,885
All other(e)	**122,854**	**87,103**	**4,072**	**31,679**	111,218	71,838	4,163	35,217
Subtotal	**1,138,099**	**601,393**	**67,906**	**468,800**	1,100,372	558,106	59,189	483,077
Loans held-for-sale and loans at fair value	**35,074**	**35,074**	**–**	**–**	39,438	39,438	–	–
Receivables from customers(f)	**10,969**	**–**	**–**	**–**	10,000	–	–	–
Total wholesale	**1,184,142**	**636,467**	**67,906**	**468,800**	1,149,810	597,544	59,189	483,077
Total exposure(g)(h)	**$ 2,535,462**	**$1,132,985**	**$ 67,906**	**$1,323,602**	$ 2,403,240	$1,075,106	$ 59,189	$1,258,945

(a) Also includes commercial card lending-related commitments.

(b) The industry rankings presented in the table as of December 31, 2021, are based on the industry rankings of the corresponding exposures at December 31, 2022, not actual rankings of such exposures at December 31, 2021.

(c) Individuals and Individual Entities predominantly consists of global private bank clients and includes exposure to personal investment companies and personal and testamentary trusts.

(d) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2022 and 2021, noted above, the Bank held: $4.8 billion and $5.3 billion, respectively, of trading assets; $6.8 billion and $15.7 billion, respectively, of AFS securities; and $19.7 billion and $14.0 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. Refer to Note 3 and Note 11 for further information.

(e) All other includes: SPEs and Private education and civic organizations, representing approximately 95% and 5%, respectively, at December 31, 2022 and 94% and 6%, respectively, at December 31, 2021. Refer to Note 15 for more information on exposures to SPEs.

(f) Receivables from customers reflect 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). Because of this collateralization, no allowance for credit losses is generally 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.

(g) Excludes cash placed with banks of $555.4 billion and $728.2 billion, at December 31, 2022 and 2021, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.

(h) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.

(i) At December 31, 2022 and 2021, included $350 million and $5.4 billion of consumer loans under the PPP, respectively. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Bank typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

(j) Represents lending-related financial instruments.

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 Credit derivatives section on pages 48-50 of this Note for a further discussion of credit derivatives.

Refer to the risk management derivatives gains and losses table on page 48 and the hedge accounting gains and losses tables on pages 45-48 of this Note for more information about risk management derivatives.

Derivative counterparties and settlement types
The Bank enters into over-the-counter ("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 central counterparties ("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 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 41-48 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 a 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 the derivatives associated with 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 expected to not 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	45-46
• Interest rate	Hedge floating-rate assets and liabilities	Cash flow hedge	47
• Foreign exchange	Hedge foreign currency-denominated assets and liabilities	Fair value hedge	45-46
• Foreign exchange	Hedge foreign currency-denominated forecasted revenue and expense	Cash flow hedge	47
• Foreign exchange	Hedge the value of the Bank's investments in non-U.S. dollar functional currency entities	Net investment hedge	48
• Commodity	Hedge commodity inventory	Fair value hedge	45-46
Manage specifically identified risk exposures not designated in qualifying hedge accounting relationships:			48
• Interest rate	Manage the risk associated with mortgage commitments, warehouse loans and MSRs	Specified risk management	48
• Credit	Manage the credit risk associated with wholesale lending exposures	Specified risk management	48
• Interest rate and foreign exchange	Manage the risk associated with certain other specified assets and liabilities	Specified risk management	48
Market-making derivatives and other activities:			
• Various	Market-making and related risk management	Market-making and other	48
• Various	Other derivatives	Market-making and other	48

Notional amount of derivative contracts

The following table summarizes the notional amount of free-standing derivative contracts outstanding as of December 31, 2022 and 2021.

	Notional amounts[b]	
December 31, (in billions)	**2022**	2021
Interest rate contracts		
Swaps	**$ 25,377**	$ 24,870
Futures and forwards	**2,149**	2,058
Written options	**3,054**	3,023
Purchased options	**3,006**	3,201
Total interest rate contracts	**33,586**	33,152
Credit derivatives[a]	**1,136**	1,041
Foreign exchange contracts		
Cross-currency swaps	**4,230**	4,150
Spot, futures and forwards	**7,046**	7,715
Written options	**776**	741
Purchased options	**760**	727
Total foreign exchange contracts	**12,812**	13,333
Equity contracts		
Swaps	**727**	809
Futures and forwards	**114**	113
Written options	**498**	506
Purchased options	**486**	494
Total equity contracts	**1,825**	1,922
Commodity contracts		
Swaps	**297**	459
Spot, futures and forwards	**138**	192
Written options	**131**	148
Purchased options	**107**	121
Total commodity contracts	**673**	920
Total derivative notional amounts	**$ 50,032**	$ 50,368

(a) Refer to the Credit derivatives discussion on pages 48-50 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, 2022 and 2021, by accounting designation (e.g., whether the derivatives were designated in qualifying hedge accounting relationships or not) and contract type.

Free-standing derivative receivables and payables[(a)]

	Gross derivative receivables				Gross derivative payables			
December 31, 2022 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	**$ 359,265**	**$ –**	**$ 359,265**	**$ 27,744**	**$ 337,831**	**$ –**	**$ 337,831**	**$ 15,453**
Credit	**9,969**	**–**	**9,969**	**1,084**	**10,027**	**–**	**10,027**	**733**
Foreign exchange	**242,220**	**379**	**242,599**	**23,273**	**251,129**	**2,503**	**253,632**	**18,822**
Equity	**52,499**	**–**	**52,499**	**7,040**	**52,468**	**–**	**52,468**	**6,886**
Commodity	**33,192**	**1,694**	**34,886**	**8,765**	**29,141**	**2,320**	**31,461**	**6,097**
Total fair value of trading assets and liabilities	**$ 697,145**	**$ 2,073**	**$ 699,218**	**$ 67,906**	**$ 680,596**	**$ 4,823**	**$ 685,419**	**$ 47,991**

	Gross derivative receivables				Gross derivative payables			
December 31, 2021 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	$ 311,492	$ –	$ 311,492	$ 22,601	$ 277,747	$ –	$ 277,747	$ 7,807
Credit	9,119	–	9,119	834	10,069	–	10,069	770
Foreign exchange	170,892	321	171,213	12,599	177,977	462	178,439	13,869
Equity	68,484	–	68,484	11,785	70,595	–	70,595	11,846
Commodity	31,628	5,406	37,034	11,370	30,108	6,886	36,994	8,785
Total fair value of trading assets and liabilities	$ 591,615	$ 5,727	$ 597,342	$ 59,189	566,496	$ 7,348	$ 573,844	$ 43,077

(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.

Derivatives netting

The following tables present, as of December 31, 2022 and 2021, 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 liquid securities and other cash collateral held at third-party custodians, which are shown separately as "Collateral not nettable on the Consolidated balance sheets" in the tables below, up to the fair value exposure amount;
- 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.

	2022			2021		
December 31, (in millions)	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables
U.S. GAAP nettable derivative receivables						
Interest rate contracts:						
OTC	**$ 263,938**	**$ (238,610)**	**$ 25,328**	$ 293,257	$ (274,811)	$ 18,446
OTC-cleared	**92,984**	**(92,607)**	**377**	13,876	(13,593)	283
Exchange-traded[a]	**553**	**(304)**	**249**	495	(487)	8
Total interest rate contracts	**357,475**	**(331,521)**	**25,954**	307,628	(288,891)	18,737
Credit contracts:						
OTC	**8,118**	**(7,181)**	**937**	7,339	(6,654)	685
OTC-cleared	**1,746**	**(1,704)**	**42**	1,671	(1,631)	40
Total credit contracts	**9,864**	**(8,885)**	**979**	9,010	(8,285)	725
Foreign exchange contracts:						
OTC	**239,012**	**(217,908)**	**21,104**	167,867	(157,911)	9,956
OTC-cleared	**1,461**	**(1,417)**	**44**	789	(703)	86
Exchange-traded[a]	**15**	**(1)**	**14**	6	–	6
Total foreign exchange contracts	**240,488**	**(219,326)**	**21,162**	168,662	(158,614)	10,048
Equity contracts:						
OTC	**38,886**	**(36,334)**	**2,552**	50,233	(46,420)	3,813
Exchange-traded[a]	**10,491**	**(9,125)**	**1,366**	11,690	(10,279)	1,411
Total equity contracts	**49,377**	**(45,459)**	**3,918**	61,923	(56,699)	5,224
Commodity contracts:						
OTC	**24,000**	**(17,264)**	**6,736**	25,561	(17,351)	8,210
OTC-cleared	**121**	**(112)**	**9**	49	(49)	–
Exchange-traded[a]	**9,103**	**(8,745)**	**358**	8,278	(8,264)	14
Total commodity contracts	**33,224**	**(26,121)**	**7,103**	33,888	(25,664)	8,224
Derivative receivables with appropriate legal opinion	**690,428**	**(631,312)**	**59,116** [d]	581,111	(538,153)	42,958 [d]
Derivative receivables where an appropriate legal opinion has not been either sought or obtained	**8,790**		**8,790**	16,231		16,231
Total derivative receivables recognized on the Consolidated balance sheets	**$ 699,218**		**$ 67,906**	$ 597,342		$ 59,189
Collateral not nettable on the Consolidated balance sheets[b][c]			**(22,953)**			(9,913)
Net amounts			**$ 44,953**			$ 49,276

December 31, (in millions)	2022			2021		
	Gross derivative payables	Amounts netted on the Consolidated balance sheets	Net derivative payables	Gross derivative payables	Amounts netted on the Consolidated balance sheets	Net derivative payables
U.S. GAAP nettable derivative payables						
Interest rate contracts:						
OTC	**$ 239,068**	**$ (225,920)**	**$ 13,148**	$ 261,126	$ (254,407)	$ 6,719
OTC-cleared	**96,413**	**(96,154)**	**259**	15,443	(15,246)	197
Exchange-traded[(a)]	**322**	**(304)**	**18**	291	(287)	4
Total interest rate contracts	**335,803**	**(322,378)**	**13,425**	276,860	(269,940)	6,920
Credit contracts:						
OTC	**8,109**	**(7,649)**	**460**	8,180	(7,688)	492
OTC-cleared	**1,674**	**(1,645)**	**29**	1,679	(1,611)	68
Total credit contracts	**9,783**	**(9,294)**	**489**	9,859	(9,299)	560
Foreign exchange contracts:						
OTC	**248,604**	**(233,393)**	**15,211**	174,349	(163,867)	10,482
OTC-cleared	**1,488**	**(1,417)**	**71**	706	(703)	3
Exchange-traded[(a)]	**20**	**—**	**20**	7	—	7
Total foreign exchange contracts	**250,112**	**(234,810)**	**15,302**	175,062	(164,570)	10,492
Equity contracts:						
OTC	**38,846**	**(36,469)**	**2,377**	51,908	(48,478)	3,430
Exchange-traded[(a)]	**9,287**	**(9,113)**	**174**	11,098	(10,271)	827
Total equity contracts	**48,133**	**(45,582)**	**2,551**	63,006	(58,749)	4,257
Commodity contracts:						
OTC	**20,601**	**(16,494)**	**4,107**	24,653	(19,660)	4,993
OTC-cleared	**112**	**(112)**	**—**	73	(73)	—
Exchange-traded[(a)]	**9,021**	**(8,758)**	**263**	8,954	(8,476)	478
Total commodity contracts	**29,734**	**(25,364)**	**4,370**	33,680	(28,209)	5,471
Derivative payables with appropriate legal opinion	**673,565**	**(637,428)**	**36,137** [(d)]	558,467	(530,767)	27,700 [(d)]
Derivative payables where an appropriate legal opinion has not been either sought or obtained	**11,854**		**11,854**	15,377		15,377
Total derivative payables recognized on the Consolidated balance sheets	**$ 685,419**		**$ 47,991**	$ 573,844		$ 43,077
Collateral not nettable on the Consolidated balance sheets[(b)(c)]			**(2,610)**			(5,748)
Net amounts			**$ 45,381**			$ 37,329

(a) Exchange-traded derivative balances that relate to futures contracts are settled daily.
(b) Includes liquid securities and other cash collateral held at third-party custodians related to derivative instruments where an appropriate legal opinion has been obtained. For some counterparties, the collateral amounts of financial instruments may exceed the derivative receivables and derivative payables balances. Where this is the case, the total amount reported is limited to the net derivative receivables and net derivative payables balances with that counterparty.
(c) Derivative collateral relates only to OTC and OTC-cleared derivative instruments.
(d) Net derivatives receivable included cash collateral netted of $67.5 billion and $71.7 billion at December 31, 2022 and 2021, respectively. Net derivatives payable included cash collateral netted of $73.6 billion and $64.3 billion at December 31, 2022 and 2021, respectively. Derivative cash collateral relates to OTC and OTC-cleared derivative instruments.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose the 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 JPMorgan Chase Bank, N.A.'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, 2022 and 2021.

OTC and OTC-cleared derivative payables containing downgrade triggers

(in millions)	**December 31, 2022**	December 31, 2021
Aggregate fair value of net derivative payables	**$ 15,518**	$ 20,037
Collateral posted	**14,673**	19,293

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, 2022 and 2021, related to OTC and OTC-cleared derivative contracts with contingent collateral or termination features that may be triggered upon a ratings downgrade. Derivatives contracts generally require additional collateral to be posted or terminations to be triggered when the predefined rating threshold is breached. A downgrade by a single rating agency that does not result in a rating lower than a preexisting corresponding rating provided by another major rating agency will generally not result in additional collateral (except in certain instances in which additional initial margin may be required upon a ratings downgrade), nor in termination payment requirements. The liquidity impact in the table is calculated based upon a downgrade below the lowest current rating of the rating agencies referred to in the derivative contract.

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

	December 31, 2022		December 31, 2021	
(in millions)	Single-notch downgrade	Two-notch downgrade	Single-notch downgrade	Two-notch downgrade
Amount of additional collateral to be posted upon downgrade[(a)]	**$ 128**	**$ 1,293**	$ 219	$ 1,577
Amount required to settle contracts with termination triggers upon downgrade[(b)]	**88**	**907**	98	782

(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, 2022 and 2021.

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, 2022, 2021 and 2020, 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.

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2022 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	**$ 7,253**	**$ (7,463)**	**$ (210)**	**$ –**	**$ (63)**	**$ –**
Foreign exchange[c]	**982**	**(877)**	**105**	**–**	**105**	**–**
Commodity[d]	**(35)**	**112**	**77**	**–**	**77**	**–**
Total	**$ 8,200**	**$ (8,228)**	**$ (28)**	**$ –**	**$ 119**	**$ –**

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2021 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	$ 2,523	$ (2,852)	$ (329)	$ –	$ (311)	$ –
Foreign exchange[c]	758	(726)	32	–	32	–
Commodity[d]	(8,013)	8,025	12	–	11	–
Total	$ (4,732)	$ 4,447	$ (285)	$ –	$ (268)	$ –

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2020 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	$ (5,111)	$ 4,640	$ (471)	$ –	$ (549)	$ –
Foreign exchange[c]	(1,817)	1,991	174	–	174	–
Commodity[d]	(1,492)	1,507	15	–	15	–
Total	$ (8,420)	$ 8,138	$ (282)	$ –	$ (360)	$ –

(a) Primarily consists of hedges of the benchmark (e.g., Secured Overnight Financing Rate ("SOFR"), 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) Effective January 1, 2022, the Bank updated its presentation in the tables above to include the amortization of income/expense associated with the inception hedge accounting adjustment applied to the hedged item; prior-period amounts have been revised to conform with the current presentation. 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) The assessment of hedge effectiveness excludes certain components of the changes in fair values of the derivatives and hedged items such as forward points on foreign exchange forward contracts, time values and cross-currency basis spreads. Excluded components may impact earnings either through amortization of the initial amount over the life of the derivative or through fair value changes recognized in the current period.
(f) Represents the change in value of amounts excluded from the assessment of effectiveness under the amortization approach, predominantly cross-currency basis spreads. The amount excluded at inception of the hedge is recognized in earnings over the life of the derivative.

As of December 31, 2022 and 2021, 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, 2022 (in millions)	Carrying amount of the hedged items[(a)(b)]	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items: Active hedging relationships[(d)]	Discontinued hedging relationships[(d)(e)]	Total
Assets				
Investment securities - AFS	**$ 84,073**[(c)]	**$ (4,149)**	**$ (1,542)**	**$ (5,691)**
Liabilities				
Long-term debt	**$ 992**	**$ —**	**$ 82**	**$ 82**

December 31, 2021 (in millions)	Carrying amount of the hedged items[(a)(b)]	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items: Active hedging relationships[(d)]	Discontinued hedging relationships[(d)(e)]	Total
Assets				
Investment securities - AFS	$ 65,746[(c)]	$ 417	$ 661	$ 1,078
Liabilities				
Long-term debt	$ 1,062	$ 15	$ 115	$ 130

(a) Excludes physical commodities with a carrying value of $24.3 billion and $22.4 billion at December 31, 2022 and 2021, 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, 2022 and 2021, the carrying amount excluded for available-for-sale securities is $20.3 billion and $14.0 billion, respectively.

(c) Carrying amount represents the amortized cost, net of allowance if applicable. Refer to Note 11 for additional information.

(d) Positive (negative) amounts related to assets represent cumulative fair value hedge basis adjustments that will reduce (increase) net interest income in future periods. Positive (negative) amounts related to liabilities represent cumulative fair value hedge basis adjustments that will increase (reduce) net interest income in future periods.

(e) Represents basis adjustments existing on the balance sheet date associated with hedged items that have been de-designated from qualifying fair value hedging relationships.

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, 2022, 2021 and 2020, respectively. The Bank includes the gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the change in cash flows on the related hedged item.

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2022 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[a]	**$ (152)**	**$ (7,131)**	**$ (6,979)**
Foreign exchange[b]	**(267)**	**(340)**	**(73)**
Total	**$ (419)**	**$ (7,471)**	**$ (7,052)**

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2021 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[a]	$ 1,032	$ (2,370)	$ (3,402)
Foreign exchange[b]	190	67	(123)
Total	$ 1,222	$ (2,303)	$ (3,525)

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2020 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[a]	$ 568	$ 3,582	$ 3,014
Foreign exchange[b]	–	41	41
Total	$ 568	$ 3,623	$ 3,055

(a) Primarily consists of hedges of SOFR-indexed and LIBOR-indexed floating-rate assets. Gains and losses were recorded in net interest income.
(b) Primarily consists of hedges of the foreign currency risk of non-U.S. dollar-denominated revenue and expense. The income statement classification of gains and losses follows the hedged item – primarily noninterest revenue and compensation expense.

The Bank did not experience any forecasted transactions that failed to occur for the years ended 2022, 2021 and 2020.

Over the next 12 months, the Bank expects that approximately $(1.5) billion (after-tax) of net losses recorded in AOCI at December 31, 2022, 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 seven 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.

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, 2022, 2021 and 2020.

Year ended December 31, (in millions)	**2022** Amounts recorded in income[(a)(b)]	**2022** Amounts recorded in OCI	2021 Amounts recorded in income[(a)(b)]	2021 Amounts recorded in OCI	2020 Amounts recorded in income[(a)(b)]	2020 Amounts recorded in OCI
Foreign exchange derivatives	**$ (77)**	**$ 2,845**	$ (168)	$ 2,303	$ (82)	$ (1,191)

(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 amounts reclassified for the years ended December 31, 2022 and 2021 were not material. The Bank reclassified net pre-tax gains of $11 million to other income related to the liquidation of certain legal entities during the year ended December 31, 2020. Refer to Note 22 for further information.

Gains and losses on derivatives used for specified risk management purposes

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

Year ended December 31, (in millions)	Derivatives gains/(losses) recorded in income **2022**	2021	2020
Contract type			
Interest rate[(a)]	**$ (830)**	$ 1,078	$ 2,994
Credit[(b)]	**51**	(94)	(176)
Foreign exchange[(c)]	**51**	73	32
Total	**$ (728)**	$ 1,057	$ 2,850

(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) in its wholesale and consumer activities and derivatives counterparty exposures in its wholesale activities, and to manage the credit risk arising from certain financial instruments in the Bank's market-making activities. 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"), broad-based index or portfolio. 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 derivative with a credit risk component 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, 2022 and 2021. 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 by the Bank through credit-related notes primarily in its market-making activities. In addition, the Bank obtains credit protection against certain loans in the retained consumer portfolio through the issuance of credit-related notes. Since these credit-related notes are not part of the market-making activities they are not included in the table below.

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

	Maximum payout/Notional amount			
December 31, 2022 (in millions)	Protection sold	Protection purchased with identical underlyings[c]	Net protection (sold)/ purchased[d]	Other protection purchased[e]
Credit derivatives				
Credit default swaps	**$ (492,104)**	**$ 505,795**	**$ 13,691**	**$ 3,014**
Other credit derivatives[a]	**(57,814)**	**67,118**	**9,304**	**10,522**
Total credit derivatives	**(549,918)**	**572,913**	**22,995**	**13,536**
Credit-related notes[b]	**–**	**–**	**–**	**7,198**
Total	**$ (549,918)**	**$ 572,913**	**$ 22,995**	**$ 20,734**

	Maximum payout/Notional amount			
December 31, 2021 (in millions)	Protection sold	Protection purchased with identical underlyings[c]	Net protection (sold)/ purchased[d]	Other protection purchased[e]
Credit derivatives				
Credit default swaps	$ (435,674)	$ 448,658	$ 12,984	$ 2,238
Other credit derivatives[a]	(61,839)	79,609	17,770	13,409
Total credit derivatives	(497,513)	528,267	30,754	15,647
Credit-related notes[b]	–	–	–	9,437
Total	$ (497,513)	$ 528,267	$ 30,754	$ 25,084

(a) Other credit derivatives predominantly consist of credit swap options and total return swaps.
(b) Represents Other protection purchased by the Bank, primarily in its market-making activities.
(c) Represents the total notional amount of protection purchased where the underlying reference instrument is identical to the reference instrument on protection sold; the notional amount of protection purchased for each individual identical underlying reference instrument may be greater or lower than the notional amount of protection sold.
(d) Does not take into account the fair value of the reference obligation at the time of settlement, which would generally reduce the amount the seller of protection pays to the buyer of protection in determining settlement value.
(e) Represents protection purchased by the 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 as of December 31, 2022 and 2021, 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 where the Bank is the purchaser of protection are comparable to the profile reflected below.

Protection sold – credit derivatives ratings[a]/maturity profile

December 31, 2022 (in millions)	**<1 year**	**1–5 years**	**>5 years**	**Total notional amount**	**Fair value of receivables[b]**	**Fair value of payables[b]**	**Net fair value**
Risk rating of reference entity							
Investment-grade	**$ (97,396)**	**$ (300,062)**	**$ (27,282)**	**$ (424,740)**	**$ 2,397**	**$ (1,985)**	**$ 412**
Noninvestment-grade	**(33,518)**	**(88,788)**	**(2,872)**	**(125,178)**	**1,326**	**(2,539)**	**(1,213)**
Total	**$ (130,914)**	**$ (388,850)**	**$ (30,154)**	**$ (549,918)**	**$ 3,723**	**$ (4,524)**	**$ (801)**

December 31, 2021 (in millions)	<1 year	1-5 years	>5 years	Total notional amount	Fair value of receivables[b]	Fair value of payables[b]	Net fair value
Risk rating of reference entity							
Investment-grade	$ (96,564)	$ (256,102)	$ (24,061)	$ (376,727)	$ 3,726	$ (545)	$ 3,181
Noninvestment-grade	(32,164)	(85,471)	(3,151)	(120,786)	2,690	(1,229)	1,461
Total	$ (128,728)	$ (341,573)	$ (27,212)	$ (497,513)	$ 6,416	$ (1,774)	$ 4,642

(a) The ratings scale is primarily based on external credit ratings defined by S&P and Moody's.
(b) Amounts are shown on a gross basis, before the benefit of legally enforceable master netting agreements including cash collateral netting.

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)	**2022**	2021	2020
Underwriting			
Equity	**$ 239**	$ 945	$ 616
Debt	**1,689**	2,886	2,065
Total underwriting	**1,928**	3,831	2,681
Advisory	**1,027**	1,401	846
Total investment banking fees	**$ 2,955**	$ 5,232	$ 3,527

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, foreign exchange and interest rate risks.

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.

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 fund 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)	2022	2021	2020
Trading revenue by instrument type			
Interest rate[(a)]	**$ 3,211**	$ 1,977	$ 3,298
Credit[(b)]	**918** [(c)]	1,959	1,682
Foreign exchange	**4,972**	2,742	4,232
Equity	**6,722**	5,750	3,889
Commodity	**2,071**	1,248	1,682
Total trading revenue	**17,894**	13,676	14,783
Private equity gains	**1**	1	1
Principal transactions	**$ 17,895**	$ 13,677	$ 14,784

(a) Includes the impact of changes in funding valuation adjustments on derivatives.
(b) Includes the impact of changes in credit valuation adjustments on derivatives, net of the associated hedging activities.
(c) Includes net markdowns on held-for-sale positions, primarily unfunded commitments, in the bridge financing portfolio.

Lending- and deposit-related fees

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

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

Year ended December 31, (in millions)	2022	2021	2020
Lending-related fees	**$ 1,465**	$ 1,471	$ 1,270
Deposit-related fees	**5,630**	5,560	5,240
Total lending- and deposit-related fees	**$ 7,095**	$ 7,031	$ 6,510

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)	2022	2021	2020
Asset management fees			
Investment management fees[(a)]	**$ 2,427**	$ 2,345	$ 2,133
All other asset management fees	**52**	44	59
Total asset management fees	**2,479**	2,389	2,192
Total administration fees[(b)]	**2,337**	2,543	2,242
Commissions and other fees			
Brokerage commissions[(c)]	**1,241**	1,409	1,542
All other commissions and fees[(d)]	**7,878**	7,680	6,430
Total commissions and fees	**9,119**	9,089	7,972
Total asset management, administration and commissions	**$ 13,935**	$ 14,021	$ 12,406

(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 operational support and services provided to JPMorgan Chase affiliates. Refer to Note 21 for additional information.

Mortgage fees and related income

This revenue category reflects production and net mortgage servicing revenue.

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

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

Refer to Note 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)	2022	2021	2020
Interchange and merchant processing income	**$ 28,085**	$ 23,592	$ 18,563
Reward costs and partner payments	**(22,162)**	(17,868)	(13,637)
Other card income[a]	**(1,502)**	(622)	(491)
Total card income	**$ 4,421**	$ 5,102	$ 4,435

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

Other income

The following table presents certain components of other income:

Year ended December 31, (in millions)	2022	2021	2020
Operating lease income	**$ 3,651**	$ 4,906	$ 5,531
Gain on sale of Visa B shares	**914**	–	–

Refer to Note 3 and 19 for additional information on Visa B shares and operating leases, respectively.

Noninterest expense

Other expense

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

Year ended December 31, (in millions)	2022	2021	2020
Legal expense	**$ 54**	$ 90	$ 793

Refer to Note 28 for additional information related to legal expense.

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)	2022	2021	2020
Interest income			
Loans[a]	**$52,657**	$41,497	$43,731
Taxable securities	**10,361**	6,452	7,841
Non-taxable securities[b]	**973**	1,040	1,142
Total investment securities[a]	**11,334**	7,492	8,983
Trading assets-debt instruments	**4,735**	3,697	3,677
Federal funds sold and securities purchased under resale agreements	**4,081**	757	1,575
Securities borrowed[c]	**478**	(144)	(15)
Deposits with banks	**9,040**	514	748
All other interest-earning assets	**1,772**	57	201
Total interest income	**84,097**	53,870	58,900
Interest expense			
Interest-bearing deposits	**11,210**	624	2,698
Federal funds purchased and securities loaned or sold under repurchase agreements	**1,411**	132	520
Trading liabilities - debt, short-term and all other interest-bearing liabilities	**1,693**	764	647
Long-term debt	**1,131**	464	914
Beneficial interest issued by consolidated VIEs	**230**	80	208
Total interest expense	**15,675**	2,064	4,987
Net interest income	**68,422**	51,806	53,913
Provision for credit losses	**6,347**	(9,296)	17,483
Net interest income after provision for credit losses	**$62,075**	$61,102	$36,430

(a) Includes the amortization/accretion of unearned income (e.g., purchase premiums/discounts and net deferred fees/costs).
(b) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(c) Negative interest and rates reflect the net impact of interest earned offset by fees paid on client-driven securities borrowed transactions.

Interest income and interest expense includes the current-period interest accruals for financial instruments measured at fair value, except for derivatives and financial instruments containing embedded derivatives that would be separately accounted for in accordance with U.S. GAAP, absent the fair value option election; for those instruments, all changes in fair value including any interest elements, are primarily reported in principal transactions revenue. For financial instruments that are not measured at fair value, the related interest is included within interest income or interest expense, as applicable. Refer to Notes 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. Substantially all the defined benefit pension plans are closed to new participants. The principal defined benefit pension plan in the U.S., which covered substantially all U.S. employees, was closed to new participants and frozen for existing participants on January 1, 2020, (and January 1, 2019 for new hires on or after December 2, 2017). Interest credits continue to accrue to participants' accounts based on their accumulated balances.

The Bank maintains unfunded postretirement benefit plans that provide medical and life insurance for certain eligible employees and retirees as well as their dependents covered under these programs. None of these plans have a material impact on the Bank's Consolidated Financial Statements.

The Bank also provides a qualified defined contribution plan in the U.S. and maintains other similar arrangements in certain non-U.S. locations. The most significant of these plans is the JPMorgan Chase 401(k) Savings Plan ("the 401(k) Savings Plan"), which covers substantially all U.S. employees. Employees can contribute to the 401(k) Savings Plan on a pretax and/or Roth 401(k) after-tax basis. The Bank makes an annual matching contribution as well as an annual profit-sharing contribution to the 401(k) Savings Plan on behalf of eligible participants.

The following table presents the pretax benefit obligations, plan assets, the net funded status, and the amounts recorded in AOCI on the Consolidated balance sheets for the Bank's significant defined benefit pension and OPEB plans.

As of or for the year ended December 31, (in millions)	Defined benefit pension and OPEB plans	
	2022	2021
Projected benefit obligations	**$ (13,080)**	$ (17,379)
Fair value of plan assets	**17,004**	22,210
Net funded status	**3,924**	4,831
Accumulated other comprehensive income/(loss)	**(2,361)**	(1,386)

The weighted-average discount rate used to value the benefit obligations as of December 31, 2022 and 2021, was 5.13% and 2.53%, respectively.

Gains and losses

Gains or losses resulting from changes in the benefit obligation and the fair value of plan assets are recorded in OCI. Amortization of net gains or losses are recognized as part of the net periodic benefit cost over subsequent periods, if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the projected benefit obligation or the fair value of the plan assets. Amortization is generally over the average expected remaining lifetime of plan participants, given the frozen status of most plans. During the year ended December 31, 2022, a remeasurement of the Bank's U.S. principal defined benefit plan during the second half of 2022, was required as a result of a pension settlement. The remeasurement resulted in a reduction in the fair value of the Bank's U.S. principal defined benefit plan assets, reflecting market conditions at the time of remeasurement, and a reduction in the plan's projected benefit obligation totaling $4.0 billion and $2.6 billion, respectively, resulting in a net decrease of $1.4 billion in pre-tax AOCI. For the year ended December 31, 2021, the net gain was predominantly attributable to market-driven increases in the fair value of plan assets and the discount rate.

The following table presents the net periodic benefit costs reported in the Consolidated statements of income for the Bank's defined benefit pension, defined contribution and OPEB plans, and in other comprehensive income for the defined benefit pension and OPEB plans.

Year ended December 31, (in millions)	Pension and OPEB plans		
	2022	2021	2020
Total net periodic defined benefit plan cost/(credit)[(a)(b)]	**$ (106)**	$ (136)	$ (209)
Total defined contribution plans	**1,257**	1,204	1,201
Total pension and OPEB cost included in noninterest expense	**$ 1,151**	$ 1,068	$ 992
Total recognized in other comprehensive (income)/loss	**$ 973**	$ (895)	$ (3)

(a) Includes $(12) million, $(16) million and $(27) million, for the years ended December 31, 2022, 2021 and 2020, 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.
(b) Includes pension settlement loss of $92 million and $33 million, respectively, for the years ended December 31, 2022 and 2021.

The following table presents the weighted-average actuarial assumptions used to determine the net periodic benefit costs for the defined benefit pension and OPEB plans.

	Defined benefit pension and OPEB plans		
Year ended December 31,	**2022**	2021	2020
Discount rate	**2.53 %**	2.17 %	2.92 %
Expected long-term rate of return on plan assets	**3.78**	2.94	3.88

Plan assumptions

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

The discount rates used in determining the benefit obligations are generally provided by the Bank's actuaries, with the Bank's principal defined benefit pension plan using a rate that was selected by reference to the yields on portfolios of bonds with maturity dates and coupons that closely match each of the plan's projected cash flows.

Investment strategy and asset allocation

The assets of the 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 Bank regularly reviews the asset allocations and asset managers, as well as other factors that could impact the portfolios, which are rebalanced when deemed necessary. The approved asset allocation ranges by asset class for the Bank's principal defined benefit plan are 42-100% debt securities, 0-40% equity securities, 0-3% real estate, and 0-12% alternatives as of December 31, 2022.

As of December 31, 2022, 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 exchange traded funds, mutual funds and collective investment funds managed by third-parties. The defined benefit pension plans hold investments that are sponsored or managed by affiliates of JPMorgan Chase in the amount of $1.7 billion and $2.5 billion, as of December 31, 2022 and 2021, respectively.

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

	Defined benefit pension plans							
	2022				2021			
December 31, (in millions)	Level 1[(a)]	Level 2[(b)]	Level 3[(c)]	Total fair value	Level 1[(a)]	Level 2[(b)]	Level 3[(c)]	Total fair value
Assets measured at fair value classified in fair value hierarchy	**$ 5,269**	**$ 9,247**	**$ 140**	**$ 14,656**	$ 6,522	$ 11,831	$ 196	$ 18,549
Assets measured at fair value using NAV as practical expedient not classified in fair value hierarchy	**–**	**–**	**–**	**2,593**	–	–	–	3,960
Net defined benefit pension plan payables not classified in fair value hierarchy	**–**	**–**	**–**	**(245)**	–	–	–	(299)
Total fair value of plan assets	**–**	**–**	**–**	**$ 17,004**	–	–	–	$ 22,210

(a) Consists predominantly of equity securities, U.S. federal, state, and local and non-U.S. government debt securities, and cash equivalents.
(b) Consists predominantly of corporate debt securities and mortgage-backed securities.
(c) Consists predominantly of participating annuity contracts.

Estimated future benefit payments

The following table presents benefit payments expected to be paid for the defined benefit pension and OPEB plans for the years indicated.

Year ended December 31, (in millions)	Defined benefit pension and OPEB plans
2023	$ 968
2024	964
2025	958
2026	933
2027	932
Years 2028–2032	4,530

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 2022, 2021 and 2020, 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, and subsequently amended effective May 18, 2021. Under the terms of the LTIP, as of December 31, 2022, 69 million shares of JPMorgan Chase's common stock were available for issuance through May 2025. 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 and/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 retained for an additional holding period, for a total combined vesting and holding period of approximately five to eight years from the grant date depending on regulations in certain countries.

Under the LTI Plans, stock appreciation rights ("SARs") and stock options have generally been granted with an exercise price equal to the fair value of JPMorgan Chase's common stock on the grant date. SARs and stock options generally expire ten years after the grant date. In 2021, JPMorgan Chase awarded its Chairman and Chief Executive Officer and its President and Chief Operating Officer 1.5 million and 750,000 SARs, respectively. There were no grants of SARs or stock options in 2022 and grants in 2020 were not material.

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, SARs and stock options activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for SARs and stock options, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes the Bank's RSUs, PSUs, SARs and stock options activity for 2022.

Year ended December 31, 2022 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs Number of units	RSUs/PSUs Weighted-average grant date fair value	SARs/Options Number of awards	SARs/Options Weighted-average exercise price	SARs/Options Weighted-average remaining contractual life (in years)	SARs/Options Aggregate intrinsic value
Outstanding, January 1	**32,203**	**$ 124.79**	**3,287**	**$ 118.45**		
Granted	**17,144**	**145.79**	**—**	**—**		
Exercised or vested	**(14,180)**	**116.98**	**(820)**	**44.85**		
Forfeited	**(1,317)**	**140.63**	**—**	**—**		
Canceled	**NA**	**NA**	**—**	–		
Transferred	**(6)**	**124.79**	**—**	**118.45**		
Outstanding, December 31	**33,844**	**$ 138.12**	**2,467**	**$ 142.90**	**7.9**	**$ 18,836**
Exercisable, December 31	**NA**	**NA**	**217**	**46.58**	**0.1**	**18,836**

The total fair value of RSUs that vested during the years ended December 31, 2022, 2021 and 2020, was $2.3 billion, $2.1 billion and $2.1 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2022, 2021 and 2020, was $71 million, $200 million and $148 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)	**2022**	2021	2020
Cost of prior grants of RSUs, PSUs, SARs and stock options that are amortized over their applicable vesting periods	**$ 893**	$ 842	$ 817
Accrual of estimated costs of share-based awards to be granted in future periods, predominantly those to full-career eligible employees	**1,126**	1,234	934
Total compensation expense related to employee share-based incentive plans	**$ 2,019**	$ 2,076	$ 1,751

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, 2022, approximately $769 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 1.9 years. The Bank does not capitalize any compensation expense related to share-based compensation awards to employees.

Tax benefits

The Bank is recognizing income tax benefits (including tax benefits from dividends or dividend equivalents) related to share-based incentive arrangements recognized in the Bank's Consolidated statements of income for the years ended December 31, 2022, 2021 and 2020, were $642 million, $691 million and $599 million, respectively.

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.

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

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

During 2022 and 2021, the Bank transferred $78.3 billion and $104.5 billion of investment securities, respectively, from AFS to HTM for capital management purposes. AOCI included pretax unrealized gains/(losses) of $(4.8) billion and $425 million, respectively, on the securities at the dates of transfer.

Unrealized gains or losses at the date of transfer of these securities continue to be reported in AOCI and are amortized into interest income on a level-yield basis over the remaining life of the securities. This amortization will offset the effect on interest income of the amortization of the premium or discount resulting from the transfer recorded at fair value.

Transfers of securities from AFS to HTM are non-cash transactions and are recorded at fair value.

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

December 31, (in millions)	2022				2021			
	Amortized cost[(b)(c)]	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost[(b)(c)]	Gross unrealized gains	Gross unrealized losses	Fair value
Available-for-sale securities								
Mortgage-backed securities:								
U.S. GSEs and government agencies	**$ 77,194**	**$ 479**	**$ 6,170**	**$ 71,503**	$ 72,801	$ 735	$ 992	$ 72,544
Residential:								
U.S.	**1,576**	**1**	**111**	**1,466**	2,128	38	2	2,164
Non-U.S.	**3,176**	**5**	**27**	**3,154**	3,882	25	1	3,906
Commercial	**2,113**	**—**	**155**	**1,958**	4,944	22	17	4,949
Total mortgage-backed securities	**84,059**	**485**	**6,463**	**78,081**	83,755	820	1,012	83,563
U.S. Treasury and government agencies	**95,217**	**302**	**3,459**	**92,060**	178,039	668	1,243	177,464
Obligations of U.S. states and municipalities	**7,075**	**86**	**403**	**6,758**	14,758	971	2	15,727
Non-U.S. government debt securities	**20,360**	**14**	**678**	**19,696**	16,161	92	46	16,207
Corporate debt securities	**342**	**—**	**6**	**336**	274	2	1	275
Asset-backed securities:								
Collateralized loan obligations	**5,916**	**1**	**125**	**5,792**	9,674	6	18	9,662
Other	**3,134**	**2**	**69**	**3,067**	5,378	44	2	5,420
Total available-for-sale securities	**216,103**	**890**	**11,203**	**205,790**	308,039	2,603	2,324	308,318
Held-to-maturity securities[(a)]								
Mortgage-backed securities:								
U.S. GSEs and government agencies	**113,492**	**35**	**13,709**	**99,818**	102,556	1,400	853	103,103
U.S. Residential	**10,503**	**3**	**1,244**	**9,262**	7,316	1	106	7,211
Commercial	**10,361**	**10**	**734**	**9,637**	3,730	11	54	3,687
Total mortgage-backed securities	**134,356**	**48**	**15,687**	**118,717**	113,602	1,412	1,013	114,001
U.S. Treasury and government agencies	**207,463**	**—**	**18,363**	**189,100**	185,204	169	2,103	183,270
Obligations of U.S. states and municipalities	**19,747**	**53**	**1,080**	**18,720**	13,985	453	44	14,394
Asset-backed securities:								
Collateralized loan obligations	**61,414**	**4**	**1,522**	**59,896**	48,869	75	22	48,922
Other	**2,325**	**—**	**110**	**2,215**	2,047	1	7	2,041
Total held-to-maturity securities	**425,305**	**105**	**36,762**	**388,648**	363,707	2,110	3,189	362,628
Total investment securities, net of allowance for credit losses	**$ 641,408**	**$ 995**	**$47,965**	**$ 594,438**	$ 671,746	$ 4,713	$ 5,513	$ 670,946

(a) The Bank purchased $33.7 billion, $111.8 billion and $12.4 billion of HTM securities for the years ended December 31, 2022, 2021 and 2020, respectively.
(b) The amortized cost of investment securities is reported net of allowance for credit losses of $67 million and $42 million at December 31, 2022 and 2021, respectively.
(c) Excludes $2.5 billion and $1.9 billion of accrued interest receivable at December 31, 2022 and 2021, respectively, included in accrued interest and accounts receivable on the Consolidated balance sheets. The Bank generally does not recognize an allowance for credit losses on accrued interest receivable, consistent with its policy to write them off no later than 90 days past due by reversing interest income. The Bank did not reverse through interest income any accrued interest receivable for the years ended December 31, 2022 and 2021.

At December 31, 2022, the investment securities portfolio consisted of debt securities with an average credit rating of AA+ (based upon external ratings where available, and where not available, based primarily upon internal risk ratings). Risk ratings are used to identify the credit quality of securities and differentiate risk within the portfolio. The 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., probability of default ("PD") and loss given default ("LGD")) may differ as they reflect internal historical experiences and assumptions. Risk ratings are assigned at acquisition, reviewed on a regular and ongoing basis by Credit Risk Management and adjusted as necessary over the life of the investment for updated information affecting the issuer's ability to fulfill its obligations.

AFS securities impairment

The following tables present the fair value and gross unrealized losses by aging category for AFS securities at December 31, 2022 and 2021. The tables exclude U.S. Treasury and government agency securities and U.S. GSE and government agency MBS with unrealized losses of $9.6 billion and $2.2 billion, at December 31, 2022 and 2021, respectively; changes in the value of these securities are generally driven by changes in interest rates rather than changes in their credit profile given the explicit or implicit guarantees provided by the U.S. government.

	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2022 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	**$ 1,187**	**$ 71**	**$ 260**	**$ 40**	**$ 1,447**	**$ 111**
Non-U.S.	**2,848**	**26**	**70**	**1**	**2,918**	**27**
Commercial	**1,131**	**74**	**813**	**81**	**1,944**	**155**
Total mortgage-backed securities	**5,166**	**171**	**1,143**	**122**	**6,309**	**293**
Obligations of U.S. states and municipalities	**3,023**	**240**	**364**	**163**	**3,387**	**403**
Non-U.S. government debt securities	**6,941**	**321**	**3,848**	**357**	**10,789**	**678**
Corporate debt securities	**150**	**2**	**186**	**4**	**336**	**6**
Asset-backed securities:						
Collateralized loan obligations	**3,010**	**61**	**2,701**	**64**	**5,711**	**125**
Other	**2,586**	**51**	**256**	**18**	**2,842**	**69**
Total available-for-sale securities with gross unrealized losses	**$ 20,876**	**$ 846**	**$ 8,498**	**$ 728**	**$ 29,374**	**$ 1,574**

	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2021 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	$ 303	$ 1	$ 45	$ 1	$ 348	$ 2
Non-U.S.	133	1	–	–	133	1
Commercial	2,557	5	349	12	2,906	17
Total mortgage-backed securities	2,993	7	394	13	3,387	20
Obligations of U.S. states and municipalities	120	2	–	–	120	2
Non-U.S. government debt securities	5,060	37	510	9	5,570	46
Corporate debt securities	166	1	–	–	166	1
Asset-backed securities:						
Collateralized loan obligations	8,110	18	208	–	8,318	18
Other	88	–	178	2	266	2
Total available-for-sale securities with gross unrealized losses	$ 16,537	$ 65	$ 1,290	$ 24	$ 17,827	$ 89

AFS securities are considered impaired if the fair value is less than the amortized cost.

The Bank recognizes impairment 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. In these circumstances the impairment loss is recognized in investment securities gains/(losses) in the Consolidated Statements of Income and is equal to the full difference between the amortized cost (net of allowance if applicable) and the fair value of the security.

For impaired debt securities that the Bank has the intent and ability to hold, the securities are evaluated to determine if a credit loss exists. If it is determined that a credit loss exists, that loss is recognized as an allowance for credit losses through the provision for credit losses in the Consolidated Statements of Income, limited by the amount of impairment. Any impairment on debt securities that the Bank has the intent and ability to hold not due to credit losses is recorded in OCI.

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

When assessing securities issued in a securitization for credit losses, the Bank estimates cash flows considering relevant market and economic data, underlying loan-level data, and structural features of the securitization, such as subordination, excess spread, overcollateralization or other forms of credit enhancement, and compares the losses projected for the underlying collateral ("pool losses") against the level of credit enhancement in the securitization structure to determine whether these features are sufficient to absorb the pool losses, or whether a credit loss exists.

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

HTM securities – credit risk

Allowance for credit losses

The allowance for credit losses represents expected credit losses over the remaining expected life of HTM securities.

The allowance for credit losses on HTM obligations of U.S. states and municipalities and commercial mortgage-backed securities is calculated by applying statistical credit loss factors (estimated PD and LGD) to the amortized cost. The credit loss factors are derived using a weighted average of five internally developed eight-quarter macroeconomic scenarios, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the forecast period. Refer to Note 14 for further information on the eight-quarter macroeconomic forecast.

The allowance for credit losses on HTM collateralized loan obligations and U.S. residential mortgage-backed securities is calculated as the difference between the amortized cost and the present value of the cash flows expected to be collected, discounted at the security's effective interest rate. These cash flow estimates are developed based on expectations of underlying collateral performance derived using the eight-quarter macroeconomic forecast and the single year straight-line interpolation, as well as considering the structural features of the security.

The application of different inputs and assumptions into the calculation of the allowance for credit losses is subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for credit losses on HTM securities.

Credit quality indicator

The primary credit quality indicator for HTM securities is the risk rating assigned to each security. At both December 31, 2022 and 2021, all HTM securities were rated investment grade and were current and accruing, with approximately 98% rated at least AA+.

Allowance for credit losses on investment securities

The allowance for credit losses on investment securities was $67 million, $42 million and $78 million as of December 31, 2022, 2021 and 2020, respectively.

Selected impacts of investment securities on the Consolidated statements of income

Year ended December 31, (in millions)	**2022**	2021	2020
Realized gains	**$ 198**	$ 595	$ 3,080
Realized losses	**(2,578)**	(940)	(2,278)
Investment securities gains/ (losses)	**$(2,380)**	$ (345)	$ 802
Provision for credit losses	**$ 25**	$ (36)	$ 68

Contractual maturities and yields

The following table presents the amortized cost and estimated fair value at December 31, 2022, of the Bank's investment securities portfolio by contractual maturity.

By remaining maturity December 31, 2022 (in millions)	Due in one year or less	Due after one year through five years	Due after five years through 10 years	Due after 10 years[(b)]	Total
Available-for-sale securities					
Mortgage-backed securities					
Amortized cost	$ 14	$ 3,634	$ 4,534	$ 75,877	$ 84,059
Fair value	14	3,459	4,573	70,035	78,081
Average yield[(a)]	2.21 %	3.58 %	5.25 %	3.62 %	3.71 %
U.S. Treasury and government agencies					
Amortized cost	$ 16,335	$ 54,936	$ 17,749	$ 6,197	$ 95,217
Fair value	16,011	52,703	17,167	6,179	92,060
Average yield[(a)]	1.27 %	3.00 %	3.99 %	6.01 %	3.08 %
Obligations of U.S. states and municipalities					
Amortized cost	$ 18	$ 47	$ 215	$ 6,795	$ 7,075
Fair value	18	46	216	6,478	6,758
Average yield[(a)]	5.03 %	3.96 %	5.24 %	5.84 %	5.81 %
Non-U.S. government debt securities					
Amortized cost	$ 12,803	$ 3,228	$ 4,329	$ –	$ 20,360
Fair value	12,795	3,107	3,794	–	19,696
Average yield[(a)]	3.54 %	2.59 %	1.37 %	– %	2.93 %
Corporate debt securities					
Amortized cost	$ 57	$ 272	$ 13	$ –	$ 342
Fair value	56	267	13	–	336
Average yield[(a)]	17.06 %	12.07 %	5.78 %	– %	12.66 %
Asset-backed securities					
Amortized cost	$ 99	$ 1,517	$ 3,647	$ 3,787	$ 9,050
Fair value	95	1,487	3,587	3,690	8,859
Average yield[(a)]	5.11 %	3.11 %	4.99 %	5.19 %	4.76 %
Total available-for-sale securities					
Amortized cost	$ 29,326	$ 63,634	$ 30,487	$ 92,656	$ 216,103
Fair value	28,989	61,069	29,350	86,382	205,790
Average yield[(a)]	2.31 %	3.05 %	3.94 %	4.01 %	3.49 %
Held-to-maturity securities					
Mortgage-backed securities					
Amortized cost	$ 98	$ 1,718	$ 12,350	$ 120,206	$ 134,372
Fair value	96	1,584	10,909	106,128	118,717
Average yield[(a)]	5.54 %	2.23 %	2.56 %	2.93 %	2.89 %
U.S. Treasury and government agencies					
Amortized cost	34,157	$ 106,325	$ 66,981	$ –	$ 207,463
Fair value	33,433	99,345	56,322	–	189,100
Average yield[(a)]	0.57 %	0.71 %	1.27 %	– %	0.87 %
Obligations of U.S. states and municipalities					
Amortized cost	$ –	$ 106	$ 2,741	$ 16,951	$ 19,798
Fair value	–	100	2,710	15,910	18,720
Average yield[(a)]	– %	3.39 %	4.03 %	4.24 %	4.21 %
Asset-backed securities					
Amortized cost	$ –	$ 30	$ 19,398	$ 44,311	$ 63,739
Fair value	–	29	19,085	42,997	62,111
Average yield[(a)]	– %	5.69 %	4.80 %	4.74 %	4.76 %
Total held-to-maturity securities					
Amortized cost	34,255	$ 108,179	$ 101,470	$ 181,468	$ 425,372
Fair value	33,529	101,058	89,026	165,035	388,648
Average yield[(a)]	0.58 %	0.74 %	2.18 %	3.50 %	2.25 %

(a) Average yield is computed using the effective yield of each security owned at the end of the period, weighted based on the amortized cost of each security. The effective yield considers the contractual coupon, amortization of premiums and accretion of discounts, and the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable. The effective yield excludes unscheduled principal prepayments; and accordingly, actual maturities of securities may differ from their contractual or expected maturities as certain securities may be prepaid. However, for certain callable debt securities, the average yield is calculated to the earliest call date.

(b) Substantially all of the 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 eight years for agency residential MBS, and six years for both agency residential collateralized mortgage obligations and 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. 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 not elected under the fair value option are measured at amortized cost. As a result of the Bank's credit risk mitigation practices described below, the Bank did not hold any allowance for credit losses with respect to resale and securities borrowed arrangements as of December 31, 2022 and 2021.

Credit risk mitigation practices

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.

The table below summarizes the gross and net amounts of the Bank's securities financing agreements, as of December 31, 2022 and 2021. 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. In transactions where the Bank is acting as the lender in a securities-for-securities lending agreement and receives securities that can be pledged or sold as collateral, 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 on the Consolidated balance sheets.

	December 31, 2022				
(in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets[b]	Net amounts[c]
Assets					
Securities purchased under resale agreements	**$ 441,264**	**$ (181,895)**	**$ 259,369**	**$ (249,268)**	**$ 10,101**
Securities borrowed	**54,693**	**(1,051)**	**53,642**	**(43,817)**	**9,825**
Liabilities					
Securities sold under repurchase agreements	**$ 259,011**	**$ (181,895)**	**$ 77,116**	**$ (75,048)**	**$ 2,068**
Securities loaned and other[a]	**15,860**	**(1,051)**	**14,809**	**(14,590)**	**219**

	December 31, 2021				
(in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets[b]	Net amounts[c]
Assets					
Securities purchased under resale agreements	$ 453,751	$ (226,360)	$ 227,391	$ (211,804)	$ 15,587
Securities borrowed	66,618	(1,507)	65,111	(56,680)	8,431
Liabilities					
Securities sold under repurchase agreements	$ 321,089	$ (226,360)	$ 94,729	$ (92,311)	$ 2,418
Securities loaned and other[a]	14,572	(1,507)	13,065	(13,054)	11

(a) Includes securities-for-securities lending agreements of $7.7 billion and $7.3 billion at December 31, 2022 and 2021, respectively, accounted for at fair value, where the Bank is acting as lender.

(b) In some cases, collateral exchanged with a counterparty exceeds the net asset or liability balance with that counterparty. In such cases, the amounts reported in this column are limited to the related net asset or liability with that counterparty.

(c) Includes securities financing agreements that provide collateral rights, but where an appropriate legal opinion with respect to the master netting agreement has not been either sought or obtained. At December 31, 2022 and 2021, included $5.9 billion and $13.7 billion, respectively, of securities purchased under resale agreements; $8.4 billion and $6.5 billion, respectively, of securities borrowed; $495 million and $818 million, respectively, of securities sold under repurchase agreements. There were no securities loaned and other agreements where the Bank has not received an appropriate legal opinion at December 31, 2022 and 2021.

The tables below present as of December 31, 2022 and 2021 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

	Gross liability balance			
	2022		2021	
December 31, (in millions)	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	**$ 512**	**$ –**	$ 9,731	$ –
U.S. Treasury, GSEs and government agencies	**93,398**	**7,704**	123,810	7,095
Obligations of U.S. states and municipalities	**5**	**72**	754	49
Non-U.S. government debt	**155,393**	**1,710**	176,423	1,820
Corporate debt securities	**9,665**	**614**	10,356	550
Asset-backed securities	**38**	**–**	15	
Equity securities	**–**	**5,760**	–	5,058
Total	**$ 259,011**	**$ 15,860**	$ 321,089	$ 14,572

	Remaining contractual maturity of the agreements				
December 31, 2022 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	**$ 77,679**	**$ 133,093**	**$ 31,212**	**$ 17,027**	**$ 259,011**
Total securities loaned and other	**14,412**	**1,147**	**3**	**298**	**15,860**

	Remaining contractual maturity of the agreements				
December 31, 2021 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	$ 96,232	$ 171,931	$ 36,894	$ 16,032	$ 321,089
Total securities loaned and other	12,274	1,923	–	375	14,572

Transfers not qualifying for sale accounting

At December 31, 2022 and 2021, the Bank held $692 million and $440 million, respectively, of financial assets for which the rights have been transferred to third parties; however, the transfers did not qualify as a sale in accordance with U.S. GAAP. These transfers have been recognized as collateralized financing transactions. The transferred assets are recorded in trading assets and loans, and the corresponding liabilities are recorded predominantly in short-term borrowings on the Consolidated balance sheets.

Note 13 – Loans

Loan accounting framework

The accounting for a loan depends on management's strategy for the loan. The Bank accounts for loans based on the following categories:

- Originated or purchased loans held-for-investment (i.e., "retained")
- Loans held-for-sale
- Loans at fair value

The following provides a detailed accounting discussion of the Bank's loans by category:

Loans held-for-investment

Originated or purchased loans held-for-investment, including PCD, are recorded at amortized cost, reflecting the principal amount outstanding, net of the following: unamortized deferred loan fees, costs, premiums or discounts; charge-offs; collection of cash; and foreign exchange. Credit card loans also include billed finance charges and fees.

Interest income

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

The Bank classifies accrued interest on loans, including accrued but unbilled interest on credit card loans, in accrued interest and accounts receivables on the Consolidated balance sheets. For credit card loans, accrued interest once billed is then recognized in the loan balances, with the related allowance recorded in the allowance for credit losses. Changes in the allowance for credit losses on accrued interest on credit card loans are recognized in the provision for credit losses and charge-offs are recognized by reversing interest income. For other loans, the Bank generally does not recognize an allowance for credit losses on accrued interest receivables, consistent with its policy to write them off no later than 90 days past due by reversing interest income.

Nonaccrual loans

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

On the date a loan is placed on nonaccrual status, all interest accrued but not collected is reversed against interest income. In addition, the amortization of deferred amounts is suspended. Interest income on nonaccrual loans may be recognized as cash interest payments are received (i.e., on a cash basis) if the recorded loan balance is deemed fully collectible; however, if there is doubt regarding the ultimate collectibility of the recorded loan balance, all interest cash receipts are applied to reduce the carrying value of the loan (the cost recovery method). For consumer loans, application of this policy typically results in the 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.

Allowance for loan losses

The allowance for loan losses represents the estimated expected credit losses in the held-for-investment loan portfolio at the balance sheet date and is recognized on the balance sheet as a contra asset, which brings the amortized cost to the net carrying value. Changes in the allowance for loan losses are recorded in the provision for credit losses on the 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 are generally charged off or charged down to the lower of the amortized cost or the net realizable value of the underlying collateral (i.e., fair value less estimated costs to sell), with an offset to the allowance for loan losses, upon reaching specified stages of delinquency in accordance with standards established by the Federal Financial Institutions Examination Council ("FFIEC"). Residential real estate loans, unmodified credit card loans and scored business banking loans are generally charged off no later than 180 days past due. Scored auto and modified credit card loans are charged off no later than 120 days past due.

Certain consumer loans are charged off or charged down to their net realizable value earlier than the FFIEC charge-off standards in the following circumstances:

- Loans modified in a 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 or charged down within 60 days of receiving notification of a bankruptcy filing).
- Auto loans upon repossession of the automobile.

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

Wholesale loans are charged off when it is highly certain that a loss has been realized. The determination of whether to recognize a charge-off includes many factors, including the prioritization of the 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 lower of its amortized cost or the estimated net realizable value of the underlying collateral, the determination of the fair value of the collateral depends on the type of collateral (e.g., securities, real estate). In cases where the collateral is in the form of liquid securities, the fair value is based on quoted market prices or broker quotes. For illiquid securities or other financial assets, the fair value of the collateral is generally estimated using a discounted cash flow model.

For residential real estate loans, collateral values are based upon external valuation sources. When it becomes likely that a borrower is either unable or unwilling to pay, the 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 12 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 for which the fair value option has been elected are measured at fair value, with changes in fair value recorded in noninterest revenue.

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

Because these loans are recognized at fair value, the 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.

Loan classification changes

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

In the event that management decides to retain a loan in the held-for-sale portfolio, the loan is transferred to the held-for-investment portfolio at amortized cost on the date of transfer. These loans are subsequently assessed for impairment based on the 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 delays, principal forgiveness, or the acceptance of equity or other assets in lieu of payments. Such modifications are accounted for and reported as TDRs. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

Loans, except for credit card loans, modified in a TDR are generally placed on nonaccrual status, although in many cases such loans were already on nonaccrual status prior to modification. These loans may be returned to performing status (the accrual of interest is resumed) if the following criteria are met: (i) the borrower has performed under the modified terms for a minimum of six months and/or six payments, and (ii) the 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.

Loans modified in TDRs are generally 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 component of the allowance throughout its remaining life, regardless of whether the loan is performing and has been returned to accrual status. Refer to Note 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 estimated costs to sell. Each quarter the fair value of the acquired property is reviewed and adjusted, if necessary, to the lower of cost or fair value. Subsequent adjustments to fair value are charged/credited to noninterest revenue. Operating expense, such as real estate taxes and maintenance, are charged to other expense.

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[(c)(d)]
• Residential real estate[(a)] • Auto and other[(b)]	• Credit card loans	• Secured by real estate • Commercial and industrial • Other[(e)]

(a) Includes scored mortgage and home equity loans.
(b) Includes scored auto and business banking loans and overdrafts.
(c) Includes loans for which the wholesale methodology is applied when determining the allowance for loan losses, as well as risk-rated banking and wealth management and auto dealer loans.
(d) The wholesale portfolio segment's classes align with loan classifications as defined by the bank regulatory agencies, based on the loan's collateral, purpose, and type of borrower.
(e) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly global private bank clients). Refer to Note 15 for more information on SPEs.

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

December 31, 2022 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total[(a)(b)]
Retained	**$ 300,746**	**$ 185,175**	**$ 601,393**	**$ 1,087,314**
Held-for-sale	**617**	**–**	**3,259**	**3,876**
At fair value	**9,980**	**–**	**31,815**	**41,795**
Total	**$ 311,343**	**$ 185,175**	**$ 636,467**	**$ 1,132,985**

December 31, 2021 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total[(a)(b)]
Retained	$ 295,547	$ 154,296	$ 558,106	$ 1,007,949
Held-for-sale	1,286	–	7,400	8,686
At fair value	26,433	–	32,038	58,471
Total	$ 323,266	$ 154,296	$ 597,544	$ 1,075,106

(a) Excludes $5.2 billion and $2.7 billion of accrued interest receivable at December 31, 2022 and 2021, respectively. The Bank wrote off accrued interest receivable of $39 million and $56 million for the years ended December 31, 2022 and 2021.
(b) Loans (other than those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2022 and 2021.

The following tables provide information about the carrying value of retained loans purchased, sold and reclassified to held-for-sale during the periods indicated. Loans that were reclassified to held-for-sale and sold in a subsequent period are excluded from the sales line of this table.

Year ended December 31, (in millions)	2022 Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	**$ 1,625** [b][c]	**$ –**	**$ 1,088**	**$ 2,713**
Sales	**2,884**	**–**	**41,934**	**44,818**
Retained loans reclassified to held-for-sale[a]	**229**	**–**	**1,055**	**1,284**

Year ended December 31, (in millions)	2021 Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 515 [b][c]	$ –	$ 1,204	$ 1,719
Sales	799	–	31,104	31,903
Retained loans reclassified to held-for-sale[a]	1,225	–	2,178	3,403

Year ended December 31, (in millions)	2020 Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 3,474 [b][c]	$ –	$ 1,159	$ 4,633
Sales	350	–	17,916	18,266
Retained loans reclassified to held-for-sale[a]	2,079	787	1,580	4,446

(a) Reclassifications of loans to held-for-sale are non-cash transactions.

(b) Predominantly includes purchases of residential real estate loans, including the Bank's voluntary repurchases of certain delinquent loans from loan pools as permitted by Government National Mortgage Association ("Ginnie Mae") guidelines for the years ended December 31, 2022, 2021 and 2020. 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 Services ("RHS"), and/or the U.S. Department of Veterans Affairs ("VA").

(c) Excludes purchases of retained loans of $12.4 billion, $25.8 billion and $16.3 billion for the years ended December 31, 2022, 2021 and 2020, respectively, which are predominantly sourced through the correspondent origination channel and underwritten in accordance with the Bank's standards. The amount of purchases of retained loans at December 31, 2020 has been revised to conform with the current presentation.

Gains and losses on sales of loans

Net gains/(losses) on sales of loans and lending-related commitments (including adjustments to record loans and lending-related commitments held-for-sale at the lower of cost or fair value) recognized in noninterest revenue was $(232) million for the year ended December 31, 2022 of which $(100) million was related to loans. Net gains/(losses) on sales of loans and lending-related commitments was $258 million for the year ended December 31, 2021 of which $250 million was related to loans. Net losses on sales of loans was $(37) million for the year ended December 31, 2020. In addition, the sale of loans may also result in write downs, recoveries or changes in the allowance recognized in the provision for credit losses.

Consumer, excluding credit card loan portfolio

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

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

December 31, (in millions)	**2022**	2021
Residential real estate	**$ 237,554**	$ 224,786
Auto and other[(a)]	**63,192**	70,761
Total retained loans	**$ 300,746**	$ 295,547

(a) At December 31, 2022 and 2021, included $350 million and $5.4 billion of loans, respectively, in business banking under the PPP.

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

- For residential real estate loans, the current estimated LTV ratio, or the combined LTV ratio in the case of junior lien loans, is an indicator of the potential loss severity in the event of default. Additionally, LTV or combined LTV ratios can provide insight into a borrower's continued willingness to pay, as the delinquency rate of high-LTV loans tends to be greater than that for loans where the borrower has equity in the collateral. The geographic distribution of the loan collateral also provides insight as to the credit quality of the portfolio, as factors such as the regional economy, home price changes and specific events such as natural disasters, will affect credit quality. The borrower's current or "refreshed" FICO score is a secondary credit quality indicator for certain loans, as FICO scores are an indication of the borrower's credit payment history. Thus, a loan to a borrower with a low FICO score (less than 660) is considered to be of higher risk than a loan to a borrower with a higher FICO score. Further, a loan to a borrower with a high LTV ratio and a low FICO score is at greater risk of default than a loan to a borrower that has both a high LTV ratio and a high FICO score.
- For scored auto and business banking loans, geographic distribution is an indicator of the credit performance of the portfolio. Similar to residential real estate loans, geographic distribution provides insights into the portfolio performance based on regional economic activity and events.

Residential real estate

The following tables provide information on delinquency, which is the primary credit quality indicator for retained residential real estate loans.

	December 31, 2022								
	Term loans by origination year[d]						Revolving loans		
(in millions, except ratios)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loan delinquency[a][b]									
Current	**$ 39,934**	**$ 66,072**	**$ 43,315**	**$ 15,397**	**$ 6,339**	**$ 49,626**	**$ 5,589**	**$ 9,685**	**$ 235,957**
30–149 days past due	**29**	**11**	**14**	**20**	**20**	**597**	**15**	**208**	**914**
150 or more days past due	**1**	**1**	**6**	**10**	**7**	**479**	**4**	**175**	**683**
Total retained loans	**$ 39,964**	**$ 66,084**	**$ 43,335**	**$ 15,427**	**$ 6,366**	**$ 50,702**	**$ 5,608**	**$ 10,068**	**$ 237,554**
% of 30+ days past due to total retained loans[c]	**0.08 %**	**0.02 %**	**0.05 %**	**0.19 %**	**0.42 %**	**2.07 %**	**0.34 %**	**3.80 %**	**0.66 %**

	December 31, 2021								
	Term loans by origination year[d]						Revolving loans		
(in millions, except ratios)	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loan delinquency[a][b]									
Current	$ 68,741	$ 48,334	$ 18,428	$ 7,929	$ 11,684	$ 49,141	$ 6,392	$ 11,807	$ 222,456
30–149 days past due	13	23	27	27	22	577	11	182	882
150 or more days past due	–	11	21	25	33	1,068	6	284	1,448
Total retained loans	$ 68,754	$ 48,368	$ 18,476	$ 7,981	$ 11,739	$ 50,786	$ 6,409	$ 12,273	$ 224,786
% of 30+ days past due to total retained loans[c]	0.02 %	0.07 %	0.26 %	0.65 %	0.47 %	3.18 %	0.27 %	3.80 %	1.02 %

(a) Individual delinquency classifications include mortgage loans insured by U.S. government agencies which were not material at December 31, 2022 and 2021.
(b) At December 31, 2022 and 2021, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
(c) Excludes mortgage loans that are 30 or more days past due insured by U.S. government agencies which were not material at December 31, 2022 and 2021. These amounts have been excluded based upon the government guarantee.
(d) Purchased loans are included in the year in which they were originated.

Approximately 37% of the total revolving loans are senior lien loans; the remaining balance are junior lien loans. The lien position the Bank holds is considered in the Bank's allowance for credit losses. Revolving loans that have been converted to term loans have higher delinquency rates than those that are still within the revolving period. That is primarily because the fully-amortizing payment that is generally required for those products is higher than the minimum payment options available for revolving loans within the revolving period.

Nonaccrual loans and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained residential real estate loans.

(in millions, except weighted-average data)	December 31, 2022	December 31, 2021
Nonaccrual loans[(a)(b)(c)(d)(e)]	$ 3,742	$ 4,756
Current estimated LTV ratios[(f)(g)(h)]		
Greater than 125% and refreshed FICO scores:		
Equal to or greater than 660	$ 2	$ 2
Less than 660	—	2
101% to 125% and refreshed FICO scores:		
Equal to or greater than 660	174	37
Less than 660	6	15
80% to 100% and refreshed FICO scores:		
Equal to or greater than 660	12,034	2,701
Less than 660	184	89
Less than 80% and refreshed FICO scores:		
Equal to or greater than 660	215,093	209,291
Less than 660	8,656	9,655
No FICO/LTV available	1,359	2,928
U.S. government-guaranteed	46	66
Total retained loans	$ 237,554	$ 224,786
Weighted average LTV ratio[(f)(i)]	51 %	50 %
Weighted average FICO[(g)(i)]	769	765
Geographic region[(j)]		
California	$ 73,111	$ 71,383
New York	34,467	32,543
Florida	18,867	16,181
Texas	14,960	13,863
Illinois	11,293	11,565
Colorado	9,968	8,885
Washington	9,059	8,292
New Jersey	7,106	6,831
Massachusetts	6,379	6,105
Connecticut	5,432	5,242
All other	46,912	43,896
Total retained loans	$ 237,554	$ 224,786

(a) Includes collateral-dependent residential real estate loans that are charged down to the fair value of the underlying collateral less costs to sell. The 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, 2022, approximately 5% of Chapter 7 residential real estate loans were 30 days or more past due.
(b) Nonaccrual loans exclude mortgage loans insured by U.S. government agencies which were not material at December 31, 2022 and 2021.
(c) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to charge down, the related allowance may be negative.
(d) Interest income on nonaccrual loans recognized on a cash basis was $175 million and $172 million for the years ended December 31, 2022 and 2021, respectively.
(e) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic.
(f) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.
(g) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Bank on at least a quarterly basis.
(h) Includes residential real estate loans, primarily held in LLCs, that did not have a refreshed FICO score. These loans have been included in a FICO band based on management's estimation of the borrower's credit quality.
(i) Excludes loans with no FICO and/or LTV data available.
(j) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2022.

Loan modifications

Modifications of residential real estate loans, where the Bank grants concessions to borrowers who are experiencing financial difficulty are generally accounted for and reported as TDRs. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs. The carrying value of new TDRs was $362 million, $866 million and $819 million for the years ended December 31, 2022, 2021 and 2020, respectively. There were no additional commitments to lend to borrowers whose residential real estate loans have been modified in TDRs.

Nature and extent of modifications

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

The following table provides information about how residential real estate loans were modified in TDRs under the 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 and loans with short-term or other insignificant modifications that are not considered concessions.

Year ended December 31,	**2022**	2021	2020
Number of loans approved for a trial modification	**3,898**	6,243	5,522
Number of loans permanently modified	**4,182**	4,588	6,850
Concession granted:[(a)]			
Interest rate reduction	**54 %**	74 %	50 %
Term or payment extension	**67**	53	49
Principal and/or interest deferred	**10**	23	14
Principal forgiveness	**1**	2	2
Other[(b)]	**37**	36	66

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

(b) Includes variable interest rate to fixed interest rate modifications and payment delays that meet the definition of a TDR.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the various concessions granted in modifications of residential real estate loans under the loss mitigation programs described above and about redefaults of certain loans modified in TDRs for the periods presented. The following table presents only the financial effects of permanent modifications and do not include temporary concessions offered through trial modifications. This table also excludes Chapter 7 loans where the sole concession granted is the discharge of debt and loans with short-term or other insignificant modifications that are not considered concessions.

Year ended December 31, (in millions, except weighted-average data)	**2022**	2021	2020
Weighted-average interest rate of loans with interest rate reductions – before TDR	**4.75 %**	4.52 %	5.09 %
Weighted-average interest rate of loans with interest rate reductions – after TDR	**3.35**	2.89	3.28
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – before TDR	**22**	23	22
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – after TDR	**38**	38	39
Charge-offs recognized upon permanent modification	**$ 1**	$ –	$ 5
Principal deferred	**16**	28	16
Principal forgiven	**2**	1	5
Balance of loans that redefaulted within one year of permanent modification[(a)]	**$ 147**	$ 160	$ 199

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

At December 31, 2022, the weighted-average estimated remaining lives of residential real estate loans permanently modified in TDRs were six years. The estimated remaining lives of these loans reflect estimated prepayments, both voluntary and involuntary (i.e., foreclosures and other forced liquidations).

Active and suspended foreclosure

At December 31, 2022 and 2021, the Bank had residential real estate loans, excluding those insured by U.S. government agencies, with a carrying value of $564 million and $618 million, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Auto and other

The following tables provide information on delinquency, which is the primary credit quality indicator for retained auto and other consumer loans.

(in millions, except ratios)	December 31, 2022								
	Term loans by origination year						Revolving loans		
	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loan delinquency									
Current	**$ 22,187**	**$ 20,212** [b]	**$ 11,401** [b]	**$ 3,991**	**$ 1,467**	**$ 578**	**$ 2,342**	**$ 118**	**$ 62,296**
30–119 days past due	**263**	**308**	**100**	**68**	**33**	**17**	**12**	**10**	**811**
120 or more days past due	**—**	**53**	**24**	**—**	**—**	**1**	**2**	**5**	**85**
Total retained loans	**$ 22,450**	**$ 20,573**	**$ 11,525**	**$ 4,059**	**$ 1,500**	**$ 596**	**$ 2,356**	**$ 133**	**$ 63,192**
% of 30+ days past due to total retained loans[a]	**1.17 %**	**1.15 %**	**0.83 %**	**1.68 %**	**2.20 %**	**3.02 %**	**0.59 %**	**11.28 %**	**1.18 %**

(in millions, except ratios)	December 31, 2021								
	Term loans by origination year						Revolving loans		
	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loan delinquency									
Current	$ 35,323 [c]	$ 18,324 [c]	$ 7,443	$ 3,671	$ 1,800	$ 666	$ 2,242	$ 120	$69,589
30–119 days past due	192	720	88	53	31	21	12	6	1,123
120 or more days past due	—	35	—	—	1	1	5	7	49
Total retained loans	$ 35,515	$ 19,079	$ 7,531	$ 3,724	$ 1,832	$ 688	$ 2,259	$ 133	$70,761
% of 30+ days past due to total retained loans[a]	0.54 %	0.47 %	1.17 %	1.42 %	1.75 %	3.20 %	0.75 %	9.77 %	0.71 % [d]

(a) At December 31, 2022 and 2021, auto and other loans excluded $153 million and $667 million, respectively, of PPP loans guaranteed by the SBA that are 30 or more days past due. These amounts have been excluded based upon the SBA guarantee.

(b) Includes $252 million of loans originated in 2021 and $98 million of loans originated in 2020 in business banking under the PPP. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Bank typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

(c) Includes $4.4 billion of loans originated in 2021 and $1.0 billion of loans originated in 2020 in business banking under the PPP.

(d) Prior-period amount has been revised to conform with the current presentation.

Nonaccrual and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained auto and other consumer loans.

	Total Auto and other	
(in millions)	**December 31, 2022**	December 31, 2021
Nonaccrual loans[(a)(b)(c)]	**$ 129**	$ 119
Geographic region[(d)]		
California	**$ 9,689**	$ 11,163
Texas	**7,216**	7,859
Florida	**4,847**	4,901
New York	**4,345**	5,848
Illinois	**2,839**	2,930
New Jersey	**2,219**	2,355
Pennsylvania	**1,822**	2,004
Georgia	**1,708**	1,748
Ohio	**1,603**	1,843
Louisiana	**1,576**	1,801
All other	**25,328**	28,309
Total retained loans	**$ 63,192**	$ 70,761

(a) At December 31, 2022 and 2021, nonaccrual loans excluded $101 million and $506 million, respectively, of PPP loans 90 or more days past due and guaranteed by the SBA, of which $76 million and $35 million, respectively, were no longer accruing interest based on the guidelines set by the SBA. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting the guidelines set by the SBA. There were no loans that were not guaranteed by the SBA that are 90 or more days past due and still accruing interest at December 31, 2022 and 2021.

(b) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to charge down, the related allowance may be negative.

(c) Interest income on nonaccrual loans recognized on a cash basis was not material for the years ended December 31, 2022 and 2021.

(d) The geographic regions presented in this table are ordered based on the magnitude of the corresponding loan balances at December 31, 2022.

Loan modifications

Certain auto and other loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs.

The impact of these modifications, as well as new TDRs, were not material to the Bank for the years ended December 31, 2022, 2021 and 2020. Additional commitments to lend to borrowers whose loans have been modified in TDRs as of December 31, 2022 and 2021 were not material.

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

The following tables provide information on delinquency, which is the primary credit quality indicator for retained credit card loans.

	December 31, 2022		
(in millions, except ratios)	Within the revolving period	Converted to term loans[a]	Total
Loan delinquency			
Current and less than 30 days past due and still accruing	**$ 181,793**	**$ 696**	**$ 182,489**
30–89 days past due and still accruing	**1,356**	**64**	**1,420**
90 or more days past due and still accruing	**1,230**	**36**	**1,266**
Total retained loans	**$ 184,379**	**$ 796**	**$ 185,175**
Loan delinquency ratios			
% of 30+ days past due to total retained loans	**1.40 %**	**12.56 %**	**1.45 %**
% of 90+ days past due to total retained loans	**0.67**	**4.52**	**0.68**

	December 31, 2021		
(in millions, except ratios)	Within the revolving period	Converted to term loans[a]	Total
Loan delinquency			
Current and less than 30 days past due and still accruing	$ 151,798	$ 901	$ 152,699
30–89 days past due and still accruing	770	59	829
90 or more days past due and still accruing	741	27	768
Total retained loans	$ 153,309	$ 987	$ 154,296
Loan delinquency ratios			
% of 30+ days past due to total retained loans	0.99 %	8.71 %	1.04 %
% of 90+ days past due to total retained loans	0.48	2.74	0.50

(a) Represents TDRs.

Other credit quality indicators

The following table provides information on other credit quality indicators for retained credit card loans.

(in millions, except ratios)	December 31, 2022	December 31, 2021
Geographic region[(a)]		
California	**$ 28,154**	$ 23,030
Texas	**19,171**	15,879
New York	**15,046**	12,652
Florida	**12,905**	10,412
Illinois	**10,089**	8,530
New Jersey	**7,643**	6,367
Ohio	**5,792**	4,923
Pennsylvania	**5,517**	4,708
Colorado	**5,493**	4,573
Arizona	**4,487**	3,668
All other	**70,878**	59,554
Total retained loans	**$ 185,175**	$ 154,296
Percentage of portfolio based on carrying value with estimated refreshed FICO scores		
Equal to or greater than 660	**86.8 %**	88.5 %
Less than 660	**13.0**	11.3
No FICO available	**0.2**	0.2

(a) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2022.

Loan modifications

The Bank may offer loan modification programs granting concessions to credit card borrowers who are experiencing financial difficulty. The Bank grants concessions for most of the credit card loans under long-term programs. These modifications involve placing the customer on a fixed payment plan, generally for 60 months, and typically include reducing the interest rate on the credit card. Substantially all modifications under the Bank's long-term programs are considered to be TDRs. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs.

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

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the concessions granted on credit card loans modified in TDRs and redefaults for the periods presented. For all periods disclosed, new enrollments were less than 1% of total retained credit card loans.

Year ended December 31, (in millions, except weighted-average data)	2022	2021	2020
Balance of new TDRs[(a)]	**$ 418**	$ 393	$ 818
Weighted-average interest rate of loans – before TDR	**19.86 %**	17.75 %	18.04 %
Weighted-average interest rate of loans – after TDR	**4.13**	5.14	4.64
Balance of loans that redefaulted within one year of modification[(b)]	**$ 34**	$ 57	$ 110

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

For credit card loans modified in TDRs, payment default is deemed to have occurred when the borrower misses two consecutive contractual payments. Defaulted modified credit card loans remain in the modification program and continue to be charged off in accordance with the Bank's standard charge-off policy.

Wholesale loan portfolio

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

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

Management considers several factors to determine an appropriate internal risk rating, including the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. The 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., PD and LGD) may differ as they reflect internal historical experiences and assumptions. The Bank generally considers internal ratings with qualitative characteristics equivalent to BBB-/Baa3 or higher as investment grade, and these ratings have a lower PD and/or lower LGD than non-investment grade ratings.

Noninvestment-grade ratings are further classified as noncriticized and criticized, and the criticized portion is further subdivided into performing and nonaccrual loans, representing management's assessment of the collectibility of principal and interest. Criticized loans have a higher PD than noncriticized loans. The 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 an actual or potential credit concern. Refer to Note 5 for further detail on industry concentrations.

The following tables provide information on internal risk rating, which is the primary credit quality indicator for retained wholesale loans.

December 31, (in millions, except ratios)	Secured by real estate		Commercial and industrial		Other[b]		Total retained loans	
	2022	2021	**2022**	2021	**2022**	2021	**2022**	2021
Loans by risk ratings								
Investment- grade	**$ 99,514**	$ 92,342	**$ 76,207**	$ 75,622	**$ 248,155**	$ 240,448	**$ 423,876**	$ 408,412
Noninvestment- grade:								
Noncriticized	**23,307**	22,498	**81,359**	62,119	**57,547**	51,711	**162,213**	136,328
Criticized performing	**3,652**	3,645	**8,965**	6,901	**728**	770	**13,345**	11,316
Criticized nonaccrual[a]	**246**	326	**1,018**	965	**695**	759	**1,959**	2,050
Total noninvestment- grade	**27,205**	26,469	**91,342**	69,985	**58,970**	53,240	**177,517**	149,694
Total retained loans	**$ 126,719**	$ 118,811	**$ 167,549**	$ 145,607	**$ 307,125**	$ 293,688	**$ 601,393**	$ 558,106
% of investment-grade to total retained loans	**78.53 %**	77.72 %	**45.48 %**	51.94 %	**80.80 %**	81.87 %	**70.48 %**	73.18 %
% of total criticized to total retained loans	**3.08**	3.34	**5.96**	5.40	**0.46**	0.52	**2.54**	2.39
% of criticized nonaccrual to total retained loans	**0.19**	0.27	**0.61**	0.66	**0.23**	0.26	**0.33**	0.37

(a) At December 31, 2021 nonaccrual loans excluded $127 million of PPP loans 90 or more days past due and guaranteed by the SBA, predominantly in commercial and industrial. At December 31, 2022 the amount excluded was not material.

(b) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly global private bank clients). Refer to Note 15 for more information on SPEs.

	Secured by real estate								
	December 31, 2022								
	Term loans by origination year						Revolving loans		
(in millions)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	**$ 24,096**	**$ 22,407**	**$ 14,773**	**$ 14,666**	**$ 5,277**	**$ 17,289**	**$ 1,006**	**$ —**	**$ 99,514**
Noninvestment-grade	**6,097**	**5,602**	**3,032**	**3,498**	**2,395**	**5,659**	**920**	**2**	**27,205**
Total retained loans	**$ 30,193**	**$ 28,009**	**$ 17,805**	**$ 18,164**	**$ 7,672**	**$ 22,948**	**$ 1,926**	**$ 2**	**$ 126,719**

	Secured by real estate								
	December 31, 2021								
	Term loans by origination year						Revolving loans		
(in millions)	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	$ 23,319	$ 16,030	$ 17,265	$ 8,103	$ 7,325	$ 19,066	$ 1,226	$ 8	$ 92,342
Noninvestment-grade	5,368	3,826	4,564	3,805	2,834	5,613	458	1	26,469
Total retained loans	$ 28,687	$ 19,856	$ 21,829	$ 11,908	$ 10,159	$ 24,679	$ 1,684	$ 9	$ 118,811

Commercial and industrial										
	December 31, 2022									
	Term loans by origination year						Revolving loans			
(in millions)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total	
Loans by risk ratings										
Investment-grade	**$ 21,051**	**$ 8,338**	**$ 3,045**	**$ 1,995**	**$ 766**	**$ 989**	**$ 40,022**	**$ 1**	**$ 76,207**	(a)
Noninvestment-grade	**24,080**	**12,444**	**3,459**	**2,506**	**525**	**1,014**	**47,232**	**82**	**91,342**	
Total retained loans	**$ 45,131**	**$ 20,782**	**$ 6,504**	**$ 4,501**	**$ 1,291**	**$ 2,003**	**$ 87,254**	**$ 83**	**$ 167,549**	

Commercial and industrial										
	December 31, 2021									
	Term loans by origination year						Revolving loans			
(in millions)	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total	
Loans by risk ratings										
Investment-grade	$ 21,252	$ 6,268	$ 3,609	$ 1,269	$ 1,108	$ 819	$ 41,296	$ 1	$ 75,622	(b)
Noninvestment-grade	19,411	7,113	4,559	2,177	930	430	35,291	74	69,985	
Total retained loans	$ 40,663	$ 13,381	$ 8,168	$ 3,446	$ 2,038	$ 1,249	$ 76,587	$ 75	$ 145,607	

(a) At December 31, 2022, $139 million of the $140 million total PPP loans in the wholesale portfolio were commercial and industrial. Of the $139 million, $58 million were originated in 2021, and $81 million were originated in 2020. PPP loans are guaranteed by the SBA and considered investment-grade. Other than in certain limited circumstances, the Bank typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

(b) At December 31, 2021, $1.1 billion of the $1.3 billion total PPP loans in the wholesale portfolio were commercial and industrial. Of the $1.1 billion, $698 million were originated in 2021 and $396 million were originated in 2020.

Other(a)									
	December 31, 2022								
	Term loans by origination year						Revolving loans		
(in millions)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	**$ 31,401**	**$ 15,505**	**$ 13,015**	**$ 4,529**	**$ 2,160**	**$ 7,055**	**$ 170,893**	**$ 3,597**	**$ 248,155**
Noninvestment-grade	**16,971**	**7,096**	**1,821**	**699**	**451**	**454**	**31,396**	**82**	**58,970**
Total retained loans	**$ 48,372**	**$ 22,601**	**$ 14,836**	**$ 5,228**	**$ 2,611**	**$ 7,509**	**$ 202,289**	**$ 3,679**	**$ 307,125**

Other(a)									
	December 31, 2021								
	Term loans by origination year						Revolving loans		
(in millions)	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	$ 25,816	$ 17,779	$ 6,124	$ 2,870	$ 3,868	$ 7,317	$ 176,073	$ 601	$ 240,448
Noninvestment-grade	17,547	2,399	1,455	935	218	408	30,273	5	53,240
Total retained loans	$ 43,363	$ 20,178	$ 7,579	$ 3,805	$ 4,086	$ 7,725	$ 206,346	$ 606	$ 293,688

(a) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly global private bank clients). Refer to Note 15 for more information on SPEs.

The following table presents additional information on retained loans secured by real estate within the Wholesale portfolio, which consists of loans secured wholly or substantially by a lien or liens on real property at origination. Multifamily lending includes financing for acquisition, leasing and construction of apartment buildings. Other commercial lending largely includes financing for acquisition, leasing and construction, largely for office, retail and industrial real estate. Included in secured by real estate loans is $6.4 billion and $5.7 billion as of December 31, 2022 and 2021, respectively, of construction and development loans made to finance land development and on-site construction of commercial, industrial, residential, or farm buildings.

December 31, (in millions, except ratios)	Multifamily		Other Commercial		Total retained loans secured by real estate	
	2022	2021	**2022**	2021	**2022**	2021
Retained loans secured by real estate	**$ 79,139**	$ 73,801	**$ 47,580**	$ 45,010	**$ 126,719**	$ 118,811
Criticized	**1,916**	1,671	**1,982**	2,300	**3,898**	3,971
% of criticized to total retained loans secured by real estate	**2.42 %**	2.26 %	**4.17 %**	5.11 %	**3.08 %**	3.34 %
Criticized nonaccrual	**$ 51**	$ 91	**$ 195**	$ 235	**$ 246**	$ 326
% of criticized nonaccrual loans to total retained loans secured by real estate	**0.06 %**	0.12 %	**0.41 %**	0.52 %	**0.19 %**	0.27 %

Geographic distribution and delinquency

The following table provides information on the geographic distribution and delinquency for retained wholesale loans.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2022	2021	**2022**	2021	**2022**	2021	**2022**	2021
Loans by geographic distribution[(a)]								
Total U.S.	**$123,753**	$115,722	**$125,273**	$106,413	**$229,293**	$214,269	**$478,319**	$436,404
Total non-U.S.	**2,966**	3,089	**42,276**	39,194	**77,832**	79,419	**123,074**	121,702
Total retained loans	**$126,719**	$118,811	**$167,549**	$145,607	**$307,125**	$293,688	**$601,393**	$558,106
Loan delinquency								
Current and less than 30 days past due and still accruing	**$126,072**	$118,139	**$165,303**	$143,379	**$305,363**	$291,218	**$596,738**	$552,736
30–89 days past due and still accruing	**400**	331	**1,128**	1,193	**1,014**	1,590	**2,542**	3,114
90 or more days past due and still accruing[(b)]	**1**	15	**100**	70	**53**	121	**154**	206
Criticized nonaccrual[(c)]	**246**	326	**1,018**	965	**695**	759	**1,959**	2,050
Total retained loans	**$126,719**	$118,811	**$167,549**	$145,607	**$307,125**	$293,688	**$601,393**	$558,106
Net charge-offs/(recoveries)	**$ 6**	$ 13	**$ 145**	$ 105	**$ 3**	$ 24	**$ 154**	$ 142
% of net charge-offs/(recoveries) to end-of-period retained loans	**– %**	0.01 %	**0.09 %**	0.07 %	**– %**	0.01 %	**0.03 %**	0.03 %

(a) The U.S. and non-U.S. distribution is determined based predominantly on the domicile of the borrower.
(b) Represents loans that are considered well-collateralized and therefore still accruing interest.
(c) At December 31, 2021 nonaccrual loans excluded $127 million of PPP loans 90 or more days past due and guaranteed by the SBA, predominantly in commercial and industrial. At December 31, 2022 the amount excluded was not material.

Nonaccrual loans

The following table provides information on retained wholesale nonaccrual loans.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2022	2021	**2022**	2021	**2022**	2021	**2022**	2021
Nonaccrual loans								
With an allowance	**$ 172**	$ 254	**$ 686**	$ 600	**$ 483**	$ 287	**$ 1,341**	$ 1,141
Without an allowance[(a)]	**74**	72	**332**	365	**212**	472	**618**	909
Total nonaccrual loans[(b)]	**$ 246**	$ 326	**$ 1,018**	$ 965	**$ 695**	$ 759	**$ 1,959**	$ 2,050

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

(b) Interest income on nonaccrual loans recognized on a cash basis were not material for the years ended December 31, 2022, and 2021.

Loan modifications

Certain loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs nor are loans for which the Bank has elected to suspend TDR accounting guidance under the option provided by the CARES Act. New TDRs during the years ended December 31, 2022, 2021 and 2020, were $801 million, $881 million and $734 million, respectively. New TDRs during the years ended December 31, 2022, 2021 and 2020 reflected the extension of maturity dates, covenant waivers, receipt of assets in partial satisfaction of the loan and deferral of principal and interest payments, predominantly in the Commercial and Industrial and Other loan classes. The impact of these modifications resulting in new TDRs was not material to the Bank for the years ended December 31, 2022, 2021 and 2020.

The carrying value of TDRs was $936 million and $607 million as of December 31, 2022 and 2021, respectively.

Note 14 – Allowance for credit losses

The Bank's allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Bank's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The allowance for credit losses comprises:

- the allowance for loan losses, which covers the Bank's retained loan portfolios (scored and risk-rated) and is presented separately on the Consolidated balance sheets,
- the allowance for lending-related commitments, which is presented on the Consolidated balance sheets in accounts payable and other liabilities, and
- the allowance for credit losses on investment securities, which is reflected in investment securities on the Consolidated balance sheets.

The income statement effect of all changes in the allowance for credit losses is recognized in the provision for credit losses.

Determining the appropriateness of the allowance for credit losses is complex and requires significant judgment by management about the effect of matters that are inherently uncertain. At least quarterly, the allowance for credit losses is reviewed by the CRO, the CFO and the Controller of JPMorgan Chase. Subsequent evaluations of credit exposures, considering the macroeconomic conditions, forecasts and other factors then prevailing, may result in significant changes in the allowance for credit losses in future periods.

The Bank's policies used to determine its allowance for loan losses and its allowance for lending-related commitments are described in the following paragraphs. Refer to Note 11 for a description of the policies used to determine the allowance for credit losses on investment securities.

Methodology for allowances for loan losses and lending-related commitments

The allowance for loan losses and allowance for lending-related commitments represents expected credit losses over the remaining expected life of retained loans and lending-related commitments that are not unconditionally cancellable. The Bank does not record an allowance for future draws on unconditionally cancellable lending-related commitments (e.g., credit cards). Expected losses related to accrued interest on credit card loans are considered in the Bank's allowance for loan losses. However, the Bank does not record an allowance on other accrued interest receivables, due to its policy to write these receivables off no later than 90 days past due by reversing interest income.

The expected life of each instrument is determined by considering its contractual term, expected prepayments, cancellation features, and certain extension and call options. The expected life of funded credit card loans is generally estimated by considering expected future payments on the credit card account, and determining how much of those amounts should be allocated to repayments of the funded loan balance (as of the balance sheet date) versus other account activity. This allocation is made using an approach that incorporates the payment application requirements of the Credit Card Accountability Responsibility and Disclosure Act of 2009, generally paying down the highest interest rate balances first.

The estimate of expected credit losses includes expected recoveries of amounts previously charged off or expected to be charged off, even if such recoveries result in a negative allowance.

Collective and Individual Assessments

When calculating the allowance for loan losses and the allowance for lending-related commitments, the Bank assesses whether exposures share similar risk characteristics. If similar risk characteristics exist, the Bank estimates expected credit losses collectively, considering the risk associated with a particular pool and the probability that the exposures within the pool will deteriorate or default. The assessment of risk characteristics is subject to significant management judgment. Emphasizing one characteristic over another or considering additional characteristics could affect the allowance.

- Relevant risk characteristics for the consumer portfolio include product type, delinquency status, current FICO scores, geographic distribution, and, for collateralized loans, current LTV ratios.
- Relevant risk characteristics for the wholesale portfolio include, risk rating, delinquency status, tenor, level and type of collateral, geography, industry, credit enhancement, product type, facility purpose, and payment terms.

The majority of the Bank's credit exposures share risk characteristics with other similar exposures, and as a result are collectively assessed for impairment ("portfolio-based component"). The portfolio-based component covers consumer loans, performing risk-rated loans and certain lending-related commitments.

If an exposure does not share risk characteristics with other exposures, the Bank generally estimates expected credit losses on an individual basis, considering expected repayment and conditions impacting that individual exposure ("asset-specific component"). The asset-specific component covers modified PCD loans, loans modified or reasonably expected to be modified in a TDR, collateral-dependent loans, as well as, risk-rated loans that have been placed on nonaccrual status.

Portfolio-based component

The portfolio-based component begins with a quantitative calculation that considers the likelihood of the borrower changing delinquency status or moving from one risk rating to another. The quantitative calculation covers expected credit losses over an instrument's expected life and is estimated by applying credit loss factors to the Bank's estimated exposure at default. The credit loss factors incorporate the probability of borrower default as well as loss severity in the event of default. They are derived using a weighted average of five internally developed macroeconomic scenarios over an eight-quarter forecast period, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the eight-quarter forecast period. The five macroeconomic scenarios consist of a central, relative adverse, extreme adverse, relative upside and extreme upside scenario, and are updated by the Bank's central forecasting team. The scenarios take into consideration the Bank's macroeconomic outlook, internal perspectives from subject matter experts across the Bank, and market consensus and involve a governed process that incorporates feedback from senior management.

The eight-quarter forecast incorporates hundreds of macroeconomic variables ("MEVs") that are relevant for exposures across the Bank, with modeled credit losses being driven primarily by a subset of less than twenty variables, including U.S. real GDP, U.S. unemployment, U.S. equity prices, U.S. interest rates, corporate credit spreads, oil prices, commercial real estate prices and HPI . The specific variables that have the greatest effect on the modeled losses of each portfolio vary by portfolio and geography.

The quantitative calculation is adjusted to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet reflected in the calculation. These adjustments are accomplished in part by analyzing the historical loss experience, including during stressed periods, for each major product or model. Management applies judgment in making this adjustment, including taking into account uncertainties associated with the economic and political conditions, quality of underwriting standards, borrower behavior, credit concentrations or deterioration within an industry, product or portfolio, as well as other relevant internal and external factors affecting the credit quality of the portfolio. In certain instances, the interrelationships between these factors create further uncertainties.

The application of different inputs into the quantitative calculation, and the assumptions used by management to adjust the quantitative calculation, are subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for loan losses and the allowance for lending-related commitments.

Asset-specific component

To determine the asset-specific component of the allowance, collateral-dependent loans (including those loans for which foreclosure is probable) and larger, nonaccrual risk-rated loans in the wholesale portfolio segment are generally evaluated individually, while smaller loans (both scored and risk-rated) are aggregated for evaluation using factors relevant for the respective class of assets.

The Bank generally measures the asset-specific allowance as the difference between the amortized cost of the loan and the present value of the cash flows expected to be collected, discounted at the loan's original effective interest rate. Subsequent changes in impairment are generally recognized as an adjustment to the allowance for loan losses. For collateral-dependent loans, the fair value of collateral less estimated costs to sell is used to determine the charge-off amount for declines in value (to reduce the amortized cost of the loan to the fair value of collateral) or the amount of negative allowance that should be recognized (for recoveries of prior charge-offs associated with improvements in the fair value of collateral).

The asset-specific component of the allowance for loans that have been or are expected to be modified in TDRs incorporates the effect of the modification on the loan's expected cash flows (including forgone interest, principal forgiveness, as well as other concessions), and also the potential for redefault. For residential real estate loans modified in or expected to be modified in TDRs, the 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 housing 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 or expected to be modified in TDRs, expected losses incorporate projected delinquencies and charge-offs based on the Bank's historical experience by type of modification program. For wholesale loans modified or expected to be modified in TDRs, expected losses incorporate management's expectation of the borrower's ability to repay under the modified terms.

Estimating the timing and amounts of future cash flows is highly judgmental as these cash flow projections rely upon estimates such as loss severities, asset valuations, default rates (including redefault rates on modified loans), the amounts and timing of interest or principal payments (including any expected prepayments) or other factors that are reflective of current and expected market conditions. These estimates are, in turn, dependent on factors such as the duration of current overall economic conditions, industry, portfolio, or borrower-specific factors, the expected outcome of insolvency proceedings as well as, in certain circumstances, other economic factors. All of these estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

Allowance for credit losses and related information

The table below summarizes information about the allowances for credit losses, and includes a breakdown of loans and lending-related commitments by impairment methodology. Refer to Note 11 for further information on the allowance for credit losses on investment securities.

(Table continued on next page)

Year ended December 31, (in millions)	2022 Consumer, excluding credit card	Credit card	Wholesale	Total
Allowance for loan losses				
Beginning balance at January 1,	$ 1,765	$ 10,250	$ 4,363	$ 16,378
Cumulative effect of a change in accounting principle(a)	NA	NA	NA	NA
Gross charge-offs	812	3,192	288	4,292
Gross recoveries collected	(543)	(789)	(134)	(1,466)
Net charge-offs	269	2,403	154	2,826
Provision for loan losses	543	3,353	2,263	6,159
Other	1	—	2	3
Ending balance at December 31,	$ 2,040	$ 11,200	$ 6,474	$ 19,714
Allowance for lending-related commitments				
Beginning balance at January 1,	$ 113	$ —	$ 2,102	$ 2,215
Cumulative effect of a change in accounting principle(a)	NA	NA	NA	NA
Provision for lending-related commitments	(37)	—	174	137
Other	—	—	—	—
Ending balance at December 31,	$ 76	$ —	$ 2,276	$ 2,352
Total allowance for investment securities	NA	NA	NA	67
Total allowance for credit losses(b)	$ 2,116	$ 11,200	$ 8,750	$ 22,133
Allowance for loan losses by impairment methodology				
Asset-specific(c)	$ (624)	$ 223	$ 466	$ 65
Portfolio-based	2,664	10,977	6,008	19,649
Total allowance for loan losses	$ 2,040	$ 11,200	$ 6,474	$ 19,714
Loans by impairment methodology				
Asset-specific(c)	$ 11,973	$ 796	$ 2,185	$ 14,954
Portfolio-based	288,773	184,379	599,208	1,072,360
Total retained loans	$ 300,746	$ 185,175	$ 601,393	$ 1,087,314
Collateral-dependent loans				
Net charge-offs	$ (33)	$ —	$ 16	$ (17)
Loans measured at fair value of collateral less cost to sell	3,582	—	460	4,042
Allowance for lending-related commitments by impairment methodology				
Asset-specific	$ —	$ —	$ 70	$ 70
Portfolio-based	76	—	2,206	2,282
Total allowance for lending-related commitments(d)	$ 76	$ —	$ 2,276	$ 2,352
Lending-related commitments by impairment methodology				
Asset-specific	$ —	$ —	$ 419	$ 419
Portfolio-based(e)	20,423	—	458,569	478,992
Total lending-related commitments	$ 20,423	$ —	$ 458,988	$ 479,411

(a) Represents the impact to allowance for credit losses upon the adoption of CECL on January 1, 2020. Refer to Note 1 for further information.
(b) At December 31, 2022 excludes an allowance for credit losses associated with certain accounts receivable of $21 million.
(c) Includes collateral dependent loans, including those considered TDRs and those for which foreclosure is deemed probable, modified PCD loans and non-collateral dependent loans that have been modified or are reasonably expected to be modified in a TDR. Also includes risk-rated loans that have been placed on nonaccrual status for the wholesale portfolio segment. The asset-specific credit card allowance for loans modified, or reasonably expected to be modified, in a TDR is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.
(d) The allowance for lending-related commitments is reported in accounts payable and other liabilities on the Consolidated balance sheets.
(e) At December 31, 2022, 2021 and 2020, lending-related commitments excluded $13.1 billion, $15.7 billion and $19.5 billion, respectively, for the consumer, excluding credit card portfolio segment; $821.3 billion, $730.5 billion and $658.5 billion, respectively, for the credit card portfolio segment; and $9.8 billion, $31.3 billion and $25.3 billion, respectively, for the wholesale portfolio segment, which were not subject to the allowance for lending-related commitments. Prior period amount for wholesale lending-related commitments, including the amount not subject to allowance, has been revised to conform with the current presentation.

(table continued from previous page)

2021				2020			
Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
$ 3,634	$ 17,800	$ 6,884	$ 28,318	$ 2,537	$ 5,683	$ 4,886	$ 13,106
NA	NA	NA	NA	297	5,517	(1,632)	4,182
630	3,651	283	4,564	805	5,077	954	6,836
(619)	(939)	(141)	(1,699)	(630)	(791)	(145)	(1,566)
11	2,712	142	2,865	175	4,286	809	5,270
(1,858)	(4,838)	(2,373)	(9,069)	974	10,886	4,436	16,296
–	–	(6)	(6)	1	–	3	4
$ 1,765	$ 10,250	$ 4,363	$ 16,378	$ 3,634	$ 17,800	$ 6,884	$ 28,318
$ 187	$ –	$ 2,218	$ 2,405	$ 12	$ –	$ 1,178	$ 1,190
NA	NA	NA	NA	133	–	(36)	97
(75)	–	(116)	(191)	42	–	1,077	1,119
1	–	–	1	–	–	(1)	(1)
$ 113	$ –	$ 2,102	$ 2,215	$ 187	$ –	$ 2,218	$ 2,405
NA	NA	NA	42	NA	NA	NA	78
$ 1,878	$ 10,250	$ 6,465	$ 18,635	$ 3,821	$ 17,800	$ 9,102	$ 30,801
$ (665)	$ 313	$ 262	$ (90)	$ (7)	$ 633	$ 681	$ 1,307
2,430	9,937	4,101	16,468	3,641	17,167	6,203	27,011
$ 1,765	$ 10,250	$ 4,363	$ 16,378	$ 3,634	$ 17,800	$ 6,884	$ 28,318
$ 13,913	$ 987	$ 2,251	$ 17,151	$ 16,625	$ 1,375	$ 3,606	$ 21,606
281,634	153,309	555,855	990,798	285,493	142,057	509,883	937,433
$ 295,547	$ 154,296	$ 558,106	$ 1,007,949	$ 302,118	$ 143,432	$ 513,489	$ 959,039
$ 33	$ –	$ 38	$ 71	$ 133	$ –	$ 75	$ 208
4,469	–	613	5,082	4,954	–	184	5,138
$ –	$ –	$ 122	$ 122	$ –	$ –	$ 114	$ 114
113	–	1,980	2,093	187	–	2,104	2,291
$ 113	$ –	$ 2,102	$ 2,215	$ 187	$ –	$ 2,218	$ 2,405
$ –	$ –	$ 664	$ 664	$ –	$ –	$ 577	$ 577
29,588	–	451,080 [(e)]	480,668	37,783	–	421,698	459,481
$ 29,588	$ –	$ 451,744	$ 481,332	$ 37,783	$ –	$ 422,275	$ 460,058

Discussion of changes in the allowance

The allowance for credit losses as of December 31, 2022 was $22.1 billion, reflecting a net addition of $3.5 billion from December 31, 2021, consisting of:

- $2.3 billion in wholesale, driven by deterioration in the Bank's macroeconomic outlook and loan growth, and
- $1.2 billion in consumer, predominantly driven by the credit card portfolio, reflecting higher outstanding balances and deterioration in the Bank's macroeconomic outlook, partially offset by a reduction in the allowance related to a decrease in uncertainty associated with borrower behavior as the effects of the pandemic gradually recede.

Deterioration in the Bank's macroeconomic outlook included both updates to the central scenario in the fourth quarter of 2022, which now reflects a mild recession, as well as the impact of the increased weight placed on the adverse scenarios beginning in the first quarter of 2022 due to the effects associated with higher inflation, changes in monetary policy, and geopolitical risks, including the war in Ukraine.

The Bank's allowance for credit losses is estimated using a weighted average of five internally developed macroeconomic scenarios. The adverse scenarios incorporate more punitive macroeconomic factors than the central case assumptions provided in the table below, resulting in a weighted average U.S. unemployment rate peaking at 5.6% in the second quarter of 2024, and a 1.2% lower U.S. real GDP exiting the second quarter of 2024.

The Bank's central case assumptions reflected U.S. unemployment rates and U.S. real GDP as follows:

	Assumptions at December 31, 2022		
	2Q23	4Q23	2Q24
U.S. unemployment rate[(a)]	**3.8 %**	**4.3 %**	**5.0 %**
YoY growth in U.S. real GDP[(b)]	**1.5 %**	**0.4 %**	**– %**
	Assumptions at December 31, 2021		
	2Q22	4Q22	2Q23
U.S. unemployment rate[(a)]	4.2 %	4.0 %	3.9 %
YoY growth in U.S. real GDP[(b)]	3.1 %	2.8 %	2.1 %

(a) Reflects quarterly average of forecasted U.S. unemployment rate.
(b) The year over year growth in U.S. real GDP in the forecast horizon of the central scenario is calculated as the percentage change in U.S. real GDP levels from the prior year.

Subsequent changes to this forecast and related estimates will be reflected in the provision for credit losses in future periods.

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 "Bank-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.

Transaction Type	*Activity*	*Consolidated Financial Statements page reference*
Credit card securitization trusts	Securitization of originated credit card receivables	93-94
Mortgage securitization trusts	Servicing and securitization of both originated and purchased residential mortgages	94-95
Mortgage and other securitization trusts	Securitization of both originated and purchased residential and commercial mortgages, and other consumer loans	94-95
Multi-seller conduits	Assisting clients in accessing the financial markets in a cost-efficient manner and structuring transactions to meet investor needs	95-96
Municipal bond vehicles	Financing of municipal bond investments	96

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 pages 97-98 of this Note for more information on consolidated VIE assets and liabilities as well as 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 consolidates the assets and liabilities of its sponsored credit card trusts as it is considered to be the primary beneficiary of these securitization trusts based on the 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, 2022 and 2021, the Bank held undivided interests in Bank-sponsored credit card securitization trusts of $6.1 billion and $7.1 billion, respectively. The Bank maintained an average undivided interest in principal receivables owned by those trusts of approximately 62%

and 57% for the years ended December 31, 2022 and 2021, respectively. The Bank did not retain any senior securities and retained $1.5 billion of subordinated securities in certain of its credit card securitization trusts at both December 31, 2022 and 2021. 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 tables present 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.

	Principal amount outstanding			The Bank interest in securitized assets in nonconsolidated VIEs[(c)(d)]			
December 31, 2022 (in millions)	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
Securitization-related[(a)]							
Residential mortgage:							
Prime/Alt-A and option ARMs	**$ 47,662**	**$ 754**	**$ 26,597**	**$ 382**	**$ 1,918**	**$ –**	**$ 2,300**
Subprime	**6,753**	**–**	**726**	**–**	**–**	**–**	**–**
Commercial and other[(b)]	**164,661**	**–**	**78,746**	**268**	**5,373**	**670**	**6,311**
Total	**$ 219,076**	**$ 754**	**$ 106,069**	**$ 650**	**$ 7,291**	**$ 670**	**$ 8,611**

	Principal amount outstanding			The Bank interest in securitized assets in nonconsolidated VIEs[(c)(d)]			
December 31, 2021 (in millions)	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
Securitization-related[(a)]							
Residential mortgage:							
Prime/Alt-A and option ARMs	$ 45,976	$ 942	$ 30,956 [(e)]	$ 399	$ 680	$ 95	$ 1,174
Subprime	7,583	–	7,102	–	–	–	–
Commercial and other[(b)]	150,077	–	59,488	300	3,274	506	4,080
Total	$ 203,636	$ 942	$ 97,546	$ 699	$ 3,954	$ 601	$ 5,254

(a) Excludes U.S. GSEs and government agency securitizations, which are not Bank-sponsored.
(b) Consists of securities backed by commercial real estate loans and non-mortgage-related consumer receivables.
(c) Excludes the following: retained servicing; securities retained from loan sales and securitization activity related to U.S. GSEs and government agencies; interest rate and foreign exchange derivatives primarily used to manage interest rate and foreign exchange risks of securitization entities. There were no senior and subordinated securities purchased in connection with the Bank's secondary market-making activities at December 31, 2022 and 2021, respectively.
(d) As of December 31, 2022 and 2021, 85% and 79%, 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 $2.3 billion and $1.1 billion of investment-grade retained interests at December 31, 2022 and 2021, respectively, and $110 million of noninvestment-grade retained interests at December 31, 2021; noninvestment-grade retained interests were not material at December 31, 2022. The retained interests in commercial and other securitization trusts consisted of $5.4 billion and $3.3 billion of investment-grade retained interests and $899 million and $801 million of noninvestment-grade retained interests at December 31, 2022 and 2021, respectively.
(e) Prior-period amount has been revised to conform with the current presentation.

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.

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.

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. Treasury and CIO may choose to invest in these securitizations as well. For commercial mortgage securitizations the power to direct the significant activities of the VIE generally is held by the servicer or investors in a specified class of securities ("controlling class"). The Bank generally does not retain an interest in the controlling class in its sponsored commercial mortgage securitization transactions.

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 the Bank 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.

In the normal course of business, the Bank makes markets in and invests in commercial paper issued by the Bank-administered multi-seller conduits. The Bank held $13.8 billion and $13.7 billion of the commercial paper issued by the Bank-administered multi-seller conduits at December 31, 2022 and 2021, 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 the 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 $10.6 billion and $13.4 billion at December 31, 2022 and 2021, 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. 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.

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, 2022 and 2021.

December 31, 2022 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other[c]	Total assets[d]	Beneficial interests in VIE assets[e]	Other[f]	Total liabilities
VIE program type							
Bank-sponsored credit card trusts	**$ –**	**$ 9,699**	**$ 100**	**$ 9,799**	**$ 1,999**	**$ 2**	**$ 2,001**
Bank-administered multi-seller conduits	**–**	**22,819**	**169**	**22,988**	**9,236**	**52**	**9,288**
Municipal bond vehicles	**2,089**	**–**	**7**	**2,096**	**2,052**	**10**	**2,062**
Mortgage securitization entities[a]	**–**	**763**	**10**	**773**	**137**	**68**	**205**
Other	**–**	**1,113** [b]	**4**	**1,117**	**–**	**–**	**–**
Total	**$ 2,089**	**$ 34,394**	**$ 290**	**$ 36,773**	**$ 13,424**	**$ 132**	**$ 13,556**

December 31, 2021 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other[c]	Total assets[d]	Beneficial interests in VIE assets[e]	Other[f]	Total liabilities
VIE program type							
Bank-sponsored credit card trusts	$ –	$ 11,108	$ 102	$ 11,210	$ 2,398	$ 1	$ 2,399
Bank-administered multi-seller conduits	1	19,883	71	19,955	6,198	58	6,256
Municipal bond vehicles	1,989	–	2	1,991	1,958	–	1,958
Mortgage securitization entities[a]	–	932	32	964	167	85	252
Other	–	1,078	–	1,078	–	–	–
Total	$ 1,990	$ 33,001	$ 207	$ 35,198	$ 10,721	$ 144	$ 10,865

(a) Includes residential mortgage securitizations.
(b) Primarily includes purchased supply chain finance receivables and purchased auto loan securitizations.
(c) Includes assets classified as cash and other assets on the Consolidated balance sheets.
(d) The assets of the consolidated VIEs included in the program types above are used to settle the liabilities of those entities. The assets and liabilities include third-party assets and liabilities of consolidated VIEs (including balances with related parties) and exclude intercompany balances that eliminate in consolidation.
(e) The interest-bearing beneficial interest liabilities issued by consolidated VIEs are classified in the line item on the Consolidated balance sheets titled, "Beneficial interests issued by consolidated VIEs". 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 $2.1 billion and $2.6 billion at December 31, 2022 and 2021, respectively.
(f) 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 $25.0 billion and $12.1 billion, of which $9.1 billion and $5.4 billion was unfunded at December 31, 2022 and 2021, respectively. The Bank assesses each project and to reduce the risk of loss, may withhold varying amounts of its capital investment until the project qualifies for tax credits. Refer to Note 23 for further information on affordable housing tax credits and 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, 2022 and 2021, was $5.8 billion and $6.8 billion, respectively. The fair value of assets held by such VIEs at December 31, 2022 and 2021 was $8.2 billion and $10.5 billion respectively.

Loan securitizations

The Bank has securitized and sold a variety of loans, including residential mortgages, credit card receivables, commercial mortgages and other consumer loans. 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.

Securitization activity

The following table provides information related to the Bank's securitization activities for the years ended December 31, 2022, 2021 and 2020, 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)	2022		2021		2020	
	Residential mortgage[(b)]	Commercial and other[(c)]	Residential mortgage[(b)]	Commercial and other[(c)]	Residential mortgage[(b)]	Commercial and other[(c)]
Principal securitized	**$ 10,218**	**$ 9,036**	$ 23,876	$ 14,917	$ 7,103	$ 6,624
All cash flows during the period:						
Proceeds received from loan sales as cash or financial instruments[(a)]	**$ 9,783**	**$ 8,921**	$ 24,450	$ 15,044	$ 7,321	$ 6,865
Servicing fees collected	**62**	**2**	152	1	211	1
Cash flows received on interests	**432**	**225**	486	207	666	182

(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) Represents prime mortgages. Excludes loan securitization activity related to U.S. GSEs and government agencies.
(c) 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,	2022	2021	2020
Residential mortgage retained interest:			
Weighted-average life (in years)	**10.8**	3.5	4.1
Weighted-average discount rate	**3.7 %**	1.9 %	2.5 %
Commercial mortgage retained interest:			
Weighted-average life (in years)	**5.7**	6	6.8
Weighted-average discount rate	**2.9 %**	1.2 %	3.0 %

Loans and excess MSRs 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 MSRs on a nonrecourse basis, predominantly to U.S. GSEs. These loans and excess MSRs 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 and Note 16 for additional information about the impact of the Bank's sale of certain excess MSRs.

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)	2022	2021	2020
Carrying value of loans sold	**$ 48,891**	$ 105,035	$ 81,153
Proceeds received from loan sales as cash	**$ 22**	$ 161	$ 45
Proceeds from loan sales as securities[(a)(b)]	**48,096**	103,286	80,186
Total proceeds received from loan sales[(c)]	**$ 48,118**	$ 103,447	$ 80,231
Gains/(losses) on loan sales[(d)(e)]	**$ (25)**	$ 9	$ 6

(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, 2022 and 2021. Substantially all of these loans and real estate are insured or guaranteed by U.S. government agencies.

December 31, (in millions)	2022	2021
Loans repurchased or option to repurchase[(a)]	**$ 837**	$ 1,020
Real estate owned	**10**	5
Foreclosed government-guaranteed residential mortgage loans[(b)]	**26**	36

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

Loan delinquencies and liquidation losses

The table below includes information about components of and delinquencies related to nonconsolidated securitized financial assets held in Bank-sponsored private-label securitization entities, in which the Bank has continuing involvement as of December 31, 2022 and 2021.

As of or for the year ended December 31, (in millions)	Securitized assets		90 days past due		Net liquidation losses/ (recoveries)	
	2022	2021	2022	2021	2022	2021
Securitized loans						
Residential mortgage:						
Prime/ Alt-A & option ARMs	**$ 26,597**	$ 30,956 [(a)]	**$ 287**	$ 1,188 [(a)]	**$ (21)**	$ 17 [(a)]
Subprime	**726**	7,102	**80**	1,062	**(3)**	8
Commercial and other	**78,746**	59,488	**426**	523	**15**	10
Total loans securitized	**$ 106,069**	$ 97,546	**$ 793**	$ 2,773	**$ (9)**	$ 35

(a) Prior-period amounts have been revised to conform with the current presentation.

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, and can be adjusted up to one year from the acquisition date as more information is obtained about the fair value of assets acquired and liabilities assumed. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment during the fourth quarter of each fiscal year, or more often if events or circumstances, such as adverse changes in the business climate, indicate that there may be an impairment.

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

Year ended December 31, (in millions)	2022	2021	2020
Balance at beginning of period[(a)]	**$ 40,202**	$ 40,075	$ 40,062
Changes during the period from:			
Business combinations[(b)]	**337**	134	–
Other[(c)]	**(19)**	(7)	13
Balance at December 31,[(a)]	**$ 40,520**	$ 40,202	$ 40,075

(a) Reflects gross goodwill balances as the Bank has not recognized any impairment losses to date.
(b) For 2022, represents goodwill associated with the acquisitions of Figg, Inc., Renovite Technologies, Inc. and Volkswagen Payments S.A. For 2021, represents goodwill associated with the acquisition of Frank, a college financial planning platform for students.
(c) Predominantly foreign currency adjustments.

Goodwill impairment testing

The Bank's goodwill was not impaired at December 31, 2022, 2021 and 2020.

The goodwill impairment test is generally performed by comparing the current fair value of the Bank with its carrying value. If the fair value is in excess of the carrying value, then the Bank's goodwill is considered not to be impaired. If the fair value is less than the carrying value, then an impairment charge is recognized for the amount by which the Bank's carrying value exceeds its fair value, up to the amount of the Bank's goodwill.

The primary method the Bank uses to estimate its fair value is the income approach. This approach projects cash flows for the forecast period and uses the perpetuity growth method to calculate terminal values. These cash flows and terminal values are then discounted using an appropriate discount rate.

Unanticipated declines in business performance, increases in credit losses, increases in capital requirements, as well as deterioration in economic or market conditions, adverse regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair value of the Bank 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), and certain derivatives (e.g., 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, 2022, 2021 and 2020.

As of or for the year ended December 31, (in millions, except where otherwise noted)	**2022**	2021	2020
Fair value at beginning of period	**$ 5,494**	$ 3,276	$ 4,699
MSR activity:			
Originations of MSRs	**798**	1,659	944
Purchase of MSRs	**1,400**	1,363	248
Disposition of MSRs[(a)]	**(822)**	(114)	(176)
Net additions/(dispositions)	**1,376**	2,908	1,016
Changes due to collection/realization of expected cash flows	**(936)**	(788)	(899)
Changes in valuation due to inputs and assumptions:			
Changes due to market interest rates and other[(b)]	**2,022**	404	(1,568)
Changes in valuation due to other inputs and assumptions:			
Projected cash flows (e.g., cost to service)	**14**	109	(54)
Discount rates	**–**	–	199
Prepayment model changes and other[(c)]	**3**	(415)	(117)
Total changes in valuation due to other inputs and assumptions	**17**	(306)	28
Total changes in valuation due to inputs and assumptions	**2,039**	98	(1,540)
Fair value at December 31,	**$ 7,973**	$ 5,494	$ 3,276
Change in unrealized gains/(losses) included in income related to MSRs held at December 31,	**$ 2,039**	$ 98	$ (1,540)
Contractual service fees, late fees and other ancillary fees included in income	**1,535**	1,298	1,325
Third-party mortgage loans serviced at December 31, (in billions)	**584**	520	448
Servicer advances, net of an allowance for uncollectible amounts, at December 31, (in billions)[(d)]	**0.8**	1.6	1.8

(a) Includes excess MSRs transferred to agency-sponsored trusts in exchange for stripped mortgage backed securities (“SMBS”) for the years ended December 31, 2022 and 2020. 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.

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, 2022, 2021 and 2020.

Year ended December 31, (in millions)	2022	2021	2020
Mortgage fees and related income			
Production revenue	**$ 497**	$ 2,215	$ 2,629
Net mortgage servicing revenue:			
Operating revenue:			
Loan servicing revenue	**1,582**	1,257	1,367
Changes in MSR asset fair value due to collection/realization of expected cash flows	**(936)**	(788)	(899)
Total operating revenue	**646**	469	468
Risk management:			
Changes in MSR asset fair value due to market interest rates and other[(a)]	**2,022**	404	(1,568)
Other changes in MSR asset fair value due to other inputs and assumptions in model[(b)]	**17**	(306)	28
Change in derivative fair value and other	**(1,946)**	(623)	1,522
Total risk management	**93**	(525)	(18)
Total net mortgage servicing revenue	**739**	(56)	450
All other	**14**	11	12
Mortgage fees and related income	**$ 1,250**	$ 2,170	$ 3,091

(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).

Changes in fair value based on variations in assumptions generally cannot be easily extrapolated, because the relationship of the change in the assumptions to the change in fair value are often highly interrelated and may not be linear. In the following 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.

The table below outlines the key economic assumptions used to determine the fair value of the Bank's MSRs at December 31, 2022 and 2021, and outlines the sensitivities of those fair values to immediate adverse changes in those assumptions, as defined below.

December 31, (in millions, except rates)	2022	2021
Weighted-average prepayment speed assumption (constant prepayment rate)	**6.12 %**	9.90 %
Impact on fair value of 10% adverse change	**$ (183)**	$ (210)
Impact on fair value of 20% adverse change	**(356)**	(404)
Weighted-average option adjusted spread[(a)]	**5.77 %**	6.44 %
Impact on fair value of 100 basis points adverse change	**$ (341)**	$ (225)
Impact on fair value of 200 basis points adverse change	**(655)**	(433)

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

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 remainder of the lease term, or estimated useful life of the improvements.

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.

Impairment is assessed periodically when events or changes in circumstances indicate that the carrying value of an asset may not be fully recoverable.

Note 18 – Deposits

At December 31, 2022 and 2021, noninterest-bearing and interest-bearing deposits were as follows.

December 31, (in millions)	**2022**	2021	
U.S. offices			
Noninterest-bearing (included **$26,483** and $8,260 at fair value)[(a)]	**$ 648,852**	$ 716,242	(b)
Interest-bearing (included **$586** and $629 at fair value)[(a)]	**1,365,661**	1,436,634	(b)
Total deposits in U.S. offices	**2,014,513**	2,152,876	
Non-U.S. offices			
Noninterest-bearing (included **$1,400** and $2,421 at fair value)[(a)]	**28,394**	27,623	
Interest-bearing (included **$273** and $169 at fair value)[(a)]	**397,815**	369,132	
Total deposits in non-U.S. offices	**426,209**	396,755	
Total deposits	**$ 2,440,722**	$2,549,631	

(a) Includes structured notes classified as deposits for which the fair value option has been elected. Refer to Note 4 for further discussion.
(b) Prior-period amounts have been revised to conform with the current presentation.

At December 31, 2022 and 2021, time deposits in denominations that met or exceeded the insured limit were as follows.

December 31, (in millions)	**2022**	2021
U.S. offices	**$ 76,698**	$ 52,675
Non-U.S. offices[(a)]	**78,241**	54,968
Total	**$154,939**	$107,643

(a) Represents all time deposits in non-U.S. offices as these deposits typically exceed the insured limit.

At December 31, 2022, the remaining maturities of interest-bearing time deposits were as follows.

December 31, 2022 (in millions)	U.S.	Non-U.S.	**Total**
2023	$ 75,626	$ 75,402	$ 151,028
2024	13,392	367	13,759
2025	300	28	328
2026	178	30	208
2027	131	897	1,028
After 5 years	572	109	681
Total	$ 90,199	$ 76,833	$ 167,032

Note 19 – Leases

The Bank as lessee

At December 31, 2022, the Bank and its subsidiaries were obligated under a number of noncancellable leases, predominantly operating leases for premises and equipment used primarily for business purposes. These leases generally have terms of 20 years or less, determined based on the contractual maturity of the lease, and include periods covered by options to extend or terminate the lease when the Bank is reasonably certain that it will exercise those options. All leases with lease terms greater than twelve months are reported as a lease liability with a corresponding right-of-use ("ROU") asset. None of these lease agreements impose restrictions on the 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 estimates 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)	**2022**	2021
Right-of-use assets	**$ 7,006**	$ 7,157
Lease liabilities	**7,495**	7,688
Weighted average remaining lease term (in years)	**8.5**	8.6
Weighted average discount rate	**3.35 %**	3.23 %
Supplemental cash flow information		
Cash paid for amounts included in the measurement of lease liabilities - operating cash flows	**$ 1,492**	$ 1,551
Supplemental non-cash information		
Right-of-use assets obtained in exchange for operating lease obligations	**$ 936**	$ 858

Year ended December 31, (in millions)	**2022**	2021
Rental expense		
Gross rental expense	**$ 1,890**	$ 1,939
Sublease rental income	**(91)**	(116)
Net rental expense	**$ 1,799**	$ 1,823

The following table presents future payments under operating leases as of December 31, 2022:

Year ended December 31, (in millions)	
2023	$ 1,428
2024	1,310
2025	1,162
2026	943
2027	800
After 2027	3,092
Total future minimum lease payments	8,735
Less: Imputed interest	(1,240)
Total	$ 7,495

In addition to the table above, as of December 31, 2022, the Bank had additional future operating lease commitments of $588 million that were signed but had not yet commenced. These operating leases will commence between 2023 and 2026 with lease terms up to 21 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. The Bank's lease financings are predominantly auto operating leases. These assets subject to operating leases 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)	2022	2021
Carrying value of assets subject to operating leases, net of accumulated depreciation	**$ 12,298**	$ 17,547
Accumulated depreciation	**4,281**	5,736

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)	2022	2021	2020
Operating lease income	**$ 3,651**	$ 4,906	$ 5,531
Depreciation expense	**2,472**	3,379	4,257

The following table presents future receipts under operating leases as of December 31, 2022:

Year ended December 31, (in millions)	
2023	$ 2,170
2024	1,178
2025	387
2026	36
2027	10
After 2027	15
Total future minimum lease receipts	$ 3,796

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, 2022.

By remaining maturity at December 31, (in millions, except rates)		2022				2021
		Under 1 year	1-5 years	After 5 years	**Total**	Total
Long-term debt payable to JPMorgan Chase & Co. and affiliates						
Senior debt:	Fixed rate	**$ –**	**$ 5**	**$ 47**	**$ 52**	$ 66
	Variable rate	**464**	**34,613**	**3**	**35,080**	35,358
	Interest rates[e]	**– %**	**4.69 %**	**– %**	**4.69 %**	0.47 %
	Subtotal	**$ 464**	**$ 34,618**	**$ 50**	**$ 35,132**	$ 35,424
Long-term debt issued to unrelated parties						
Federal Home Loan Banks ("FHLB") advances:	Fixed rate	**$ 4**	**$ 43**	**$ 46**	**$ 93**	$ 110
	Variable rate	**7,000**	**4,000**	**–**	**11,000**	11,000
	Interest rates[e]	**4.36 %**	**4.22 %**	**6.08 %**	**4.32 %**	0.23%
Senior debt:	Fixed rate	**$ 756**	**$ 4,406**	**$ 5,720**	**$ 10,882**	$ 15,188
	Variable rate	**5,731**	**7,916**	**4,123**	**17,770**	22,033
	Interest rates[e]	**4.12 %**	**4.85 %**	**1.63%**	**2.01 %**	2.07%
Subordinated debt:	Fixed rate	**$ –**	**$ 261**	**$ –**	**$ 261**	$ 287
	Interest rates[e]	**– %**	**8.25 %**	**– %**	**8.25 %**	8.25 %
	Subtotal	**$ 13,491**	**$ 16,626**	**$ 9,889**	**$ 40,006**	$ 48,618
Total long-term debt[a][b][c]		**$ 13,955**	**$ 51,244**	**$ 9,939**	**$ 75,138** [f][g]	$ 84,042
Long-term beneficial interests:						
	Fixed rate	**$ 1,000**	**$ 999**	**$ –**	**$ 1,999**	$ 1,749
	Variable rate	**–**	**–**	**138**	**138**	817
	Interest rates[e]	**1.53 %**	**3.97 %**	**3.50 %**	**2.80 %**	1.58 %
Total long-term beneficial interests[d]		**$ 1,000**	**$ 999**	**$ 138**	**$ 2,137**	$ 2,566

(a) Included long-term debt of $13.8 billion and $14.0 billion secured by assets totaling $208.3 billion and $170.6 billion at December 31, 2022 and 2021, respectively. The amount of long-term debt secured by assets does not include amounts related to hybrid instruments.

(b) Included $27.1 billion and $35.6 billion of long-term debt accounted for at fair value at December 31, 2022 and 2021, respectively.

(c) Included $2.4 billion and $2.9 billion of outstanding zero-coupon notes at December 31, 2022 and 2021, respectively. The aggregate principal amount of these notes at their respective maturities is $4.4 billion and $4.8 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.

(d) 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 $11.3 billion and $8.2 billion at December 31, 2022 and 2021, respectively.

(e) The interest rates shown are the weighted average of contractual rates in effect at December 31, 2022 and 2021, respectively, including non-U.S. dollar fixed- and variable-rate issuances, which excludes the effects of the associated derivative instruments used in hedge accounting relationships, if applicable. The interest rates shown exclude structured notes accounted for at fair value.

(f) At December 31, 2022, long-term debt in the aggregate of $4.5 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 2022 is $14.0 billion in 2023, $42.8 billion in 2024, $3.0 billion in 2025, $2.9 billion in 2026 and $2.6 billion in 2027.

The weighted-average contractual interest rates for total long-term debt excluding structured notes accounted for at fair value were 4.47% and 0.56% as of December 31, 2022 and 2021, 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 4.46% and 0.53% as of December 31, 2022 and 2021, respectively.

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.

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 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, other shared corporate service costs, and employee related costs associated with risk management expertise and trading services. 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.

Revenue and expense-related transactions with related parties are listed below.

Year ended December 31, (in millions)	**2022**	2021	2020
Interest income and Interest expense			
Interest income	**$ 1,952**	$ (9)	$ 448
Interest expense	**2,606**	390	1,108
Net interest income	**(654)**	(399)	(660)
Noninterest revenue			
Principal transactions	**20,105**	8,691	(9,728)
All other income[(a)]	**7,637**	7,391	6,126
Total noninterest revenue	**27,742**	16,082	(3,602)
Noninterest expense[(a)]	**6,046**	6,619	5,444

Balances with related parties are listed below.

December 31, (in millions)	**2022**	2021
Assets		
Federal funds sold and securities purchased under resale agreements	**$ 107,038**	$ 100,802
Accrued interest and accounts receivable	**28,989**	36,323
All other assets	**6,487**	7,094
Liabilities		
Deposits[(b)]	**100,548**	87,494
Federal funds purchased and securities loaned or sold under repurchase agreements	**40,821**	43,773
Accounts payable and all other liabilities	**13,749**	12,281
Long-term debt	**35,132**	35,424

(a) All other income includes fees earned by the Bank for services provided to JPMorgan Chase affiliates. Noninterest expense includes fees incurred by the Bank for services provided from JPMorgan Chase affiliates.

(b) At December 31, 2022 and 2021, includes $25.0 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, 2022 and 2021.

	2022		2021	
December 31, (in millions)	Gross derivative receivable/payable	Net derivative receivable/payable	Gross derivative receivable/payable	Net derivative receivable/payable
Derivative receivables from affiliates	**$ 89,480**	**$ 322**	$ 78,723	$ 3,148
Derivative payables to affiliates	**77,784**	**56**	71,525	1

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 gain/(loss) 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 ended December 31, (in millions)	Unrealized gains/(losses) on investment securities	Translation adjustments, net of 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, 2019	$ 4,016	$ (485)	$ 61	$ (1,722)	$ (114)	$ 1,756
Net change	4,146	242	2,322	(3)	(45)	6,662
Balance at December 31, 2020	$ 8,162 (a)	$ (243)	$ 2,383	$ (1,725)	$ (159)	$ 8,418
Net change	(5,516)	(442)	(2,679)	688	(291)	(8,240)
Balance at December 31, 2021	$ 2,646 (a)	$ (685)	$ (296)	$ (1,037)	$ (450)	$ 178
Net change	(11,751)	(555)	(5,359)	(742)	265	(18,142)
Balance at December 31, 2022	**$ (9,105)** (a)	**$ (1,240)**	**$(5,655)**	**$ (1,779)**	**$ (185)**	**$ (17,964)**

(a) Includes after-tax net unamortized unrealized gains/(losses) of $(1.3) billion, $2.4 billion and $3.3 billion related to AFS securities that have been transferred to HTM for the years ended 2022, 2021 and 2020, respectively. Refer to Note 11 for further information.

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

Year ended December 31, (in millions)	2022 Pre-tax	2022 Tax effect	2022 After-tax	2021 Pre-tax	2021 Tax effect	2021 After-tax	2020 Pre-tax	2020 Tax effect	2020 After-tax
Unrealized gains/(losses) on investment securities									
Net unrealized gains/(losses) arising during the period	**$(17,844)**	**$ 4,285**	**$(13,559)**	$ (7,604)	$ 1,826	$(5,778)	$ 6,258	$(1,502)	$ 4,756
Reclassification adjustment for realized (gains)/losses included in net income[(a)]	**2,380**	**(572)**	**1,808**	345	(83)	262	(802)	192	(610)
Net change	**(15,464)**	**3,713**	**(11,751)**	(7,259)	1,743	(5,516)	5,456	(1,310)	4,146
Translation adjustments[(b)]									
Translation	**(2,859)**	**142**	**(2,717)**	(2,297)	107	(2,190)	1,200	(44)	1,156
Hedges	**2,842**	**(680)**	**2,162**	2,302	(554)	1,748	(1,202)	288	(914)
Net change	**(17)**	**(538)**	**(555)**	5	(447)	(442)	(2)	244	242
Cash flow hedges									
Net unrealized gains/(losses) arising during the period	**(7,471)**	**1,794**	**(5,677)**	(2,303)	553	(1,750)	3,623	(869)	2,754
Reclassification adjustment for realized (gains)/losses included in net income[(c)]	**419**	**(101)**	**318**	(1,222)	293	(929)	(568)	136	(432)
Net change	**(7,052)**	**1,693**	**(5,359)**	(3,525)	846	(2,679)	3,055	(733)	2,322
Defined benefit pension and OPEB plans, net change[(d)]	**(973)**	**231**	**(742)**	895	(207)	688	3	(6)	(3)
DVA on fair value option elected liabilities, net change	**$ 355**	**$ (90)**	**$ 265**	$ (389)	$ 98	$ (291)	$ (60)	$ 15	$ (45)
Total other comprehensive income/(loss)	**$(23,151)**	**$ 5,009**	**$(18,142)**	$ (10,273)	$ 2,033	$(8,240)	$ 8,452	$(1,790)	$ 6,662

(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. The amount reclassified for the years ended December 31, 2022 was not material. During the year ended December 31, 2021, the Bank reclassified a net pre-tax loss of $7 million. During the year ended December 31, 2020, the Bank reclassified a net pre-tax gain of $6 million.

(c) The pre-tax amounts are primarily recorded in noninterest revenue, net interest income and compensation expense in the Consolidated statements of income.

(d) During the year ended December 31, 2022, a remeasurement of the Bank's U.S. principal defined benefit plan during the second half of 2022, was required as a result of a pension settlement. The remeasurement resulted in a net decrease of $1.4 billion in pre-tax AOCI. Refer to Note 9 for further information.

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,	**2022**	2021	2020
Statutory U.S. federal tax rate	**21.0 %**	21.0 %	21.0 %
Increase/(decrease) in tax rate resulting from:			
U.S. state and local income taxes, net of U.S. federal income tax benefit	**2.9**	3.0	1.9
Tax-exempt income	**(0.8)**	(0.8)	(1.6)
Non-U.S. earnings	**0.5**	0.7	1.8
Business tax credits	**(2.2)**	(1.5)	(1.8)
Other, net	**0.4**	–	1.4
Effective tax rate	**21.8 %**	22.4 %	22.7 %

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)	**2022**	2021	2020
Current income tax expense/ (benefit)			
U.S. federal	**$ 8,222**	$ 4,910	$ 6,278
Non-U.S.	**2,716**	2,384	2,466
U.S. state and local	**2,156**	1,560	1,245
Total current income tax expense/ (benefit)	**13,094**	8,854	9,989
Deferred income tax expense/ (benefit)			
U.S. federal	**(2,849)**	1,938	(3,118)
Non-U.S.	**(161)**	(97)	(113)
U.S. state and local	**(532)**	306	(588)
Total deferred income tax expense/(benefit)	**(3,542)**	2,147	(3,819)
Total income tax expense	**$ 9,552**	$11,001	$ 6,170

Total income tax expense includes $213 million of tax benefits in 2022, $72 million of tax expenses in 2021, and $25 million of tax benefits in 2020, resulting from the resolution of tax audits.

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 an increase of $5.0 billion in 2022, an increase of $2.0 billion in 2021, and a decrease of $1.0 billion in 2020.

Results from U.S. and 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)	2022	2021	2020
U.S.	**$ 33,376**	$ 40,737	$ 19,839
Non-U.S.[(a)]	**10,518**	8,319	7,364
Income before income tax expense	**$ 43,894**	$ 49,056	$ 27,203

(a) For purposes of this table, non-U.S. income is defined as income generated from operations located outside the U.S.

The Bank will recognize any U.S. income tax expense it may incur on global intangible low tax income as income tax expense in the period in which the tax is incurred. At December 31, 2022 the income tax expense incurred was not material.

Affordable housing tax credits

The Bank recognized $1.8 billion of tax credits and other tax benefits associated with investments in affordable housing projects within income tax expense for the year ended 2022, and $1.7 billion and $1.5 billion for the years ended 2021 and 2020, respectively. The amount of amortization of such investments reported in income tax expense was $1.3 billion, $1.3 billion and $1.2 billion for the years ended 2022, 2021 and 2020, respectively. The carrying value of these investments, which are reported in other assets on the Bank's Consolidated balance sheets, was $12.0 billion and $10.8 billion at December 31, 2022 and 2021, 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 $5.4 billion and $4.6 billion at December 31, 2022 and 2021, respectively.

Deferred taxes

Deferred income tax expense/(benefit) results from differences between assets and liabilities measured for financial reporting purposes versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. If a deferred tax asset is determined to be unrealizable, a valuation allowance is established. The significant components of deferred tax assets and liabilities are reflected in the following table.

December 31, (in millions)	2022	2021
Deferred tax assets		
Allowance for loan losses	**$ 5,179**	$ 4,328
Employee benefits	**47**	–
Accrued expenses and other	**7,843**	3,153
Non-U.S. operations	**1,007**	777
Tax attribute carryforwards	**73**	235
Gross deferred tax assets	**14,149**	8,493
Valuation allowance	**(71)**	(237)
Deferred tax assets, net of valuation allowance	**$ 14,078**	$ 8,256
Deferred tax liabilities		
Depreciation and amortization	**$ 1,169**	$ 2,257
Mortgage servicing rights, net of hedges	**1,864**	2,049
Leasing transactions	**2,852**	4,182
Other, net	**1,591**	2,657
Gross deferred tax liabilities	**7,476**	11,145
Net deferred tax assets/(liabilities)	**$ 6,602**	$ (2,889)

The Bank has recorded deferred tax assets of $73 million at December 31, 2022, in connection with U.S. federal and non-U.S. net operating loss ("NOL") carryforwards and foreign tax credit ("FTC") carryforwards. At December 31, 2022, total U.S. federal NOL carryforwards were approximately $2 million and non-U.S. NOL carryforwards were approximately $161 million, and FTC carryforwards were $31 million. If not utilized, a portion of the U.S. federal NOL carryforwards will have an unlimited carryforward period. Similarly, certain non-U.S. NOL carryforwards will expire between 2026 and 2039 whereas others have an unlimited carryforward period. The FTC carryforwards will expire between 2029 and 2030.

The valuation allowance at December 31, 2022, was due to FTC carryforwards and certain non-U.S. deferred tax assets, including NOL carryforwards.

Unrecognized tax benefits

At December 31, 2022, 2021 and 2020, the Bank's unrecognized tax benefits, excluding related interest expense and penalties, were $3.4 billion, $3.2 billion and $3.0 billion, respectively, of which $2.6 billion, $2.4 billion and $2.2 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 evaluates the need for changes in unrecognized tax benefits based on its anticipated tax return filing positions as part of its U.S. federal and state and local tax returns. In addition, 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. The evaluation of unrecognized tax benefits as well as the potential for audit settlements make it reasonably possible that over the next 12 months the gross balance of unrecognized tax benefits may increase or decrease by as much as approximately $800 million.The change in the unrecognized tax benefit would result in a 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)	**2022**	2021	2020
Balance at January 1,	**$ 3,235**	$ 3,005	$ 2,761
Increases based on tax positions related to the current period	**822**	481	382
Increases based on tax positions related to prior periods	**36**	357	355
Decreases based on tax positions related to prior periods	**(543)**	(467)	(467)
Decreases related to cash settlements with taxing authorities	**(123)**	(142)	(26)
Balance at December 31,	**$ 3,427**	$ 3,235	$ 3,005

After-tax interest expense/(benefit) and penalties related to income tax liabilities recognized in income tax expense were $99 million, $128 million and $111 million in 2022, 2021 and 2020, respectively.

At December 31, 2022 and 2021, in addition to the liability for unrecognized tax benefits, the Bank had accrued $868 million and $741 million, respectively, for income tax-related interest and penalties.

Tax examination status

JPMorgan Chase is continually under examination by the Internal Revenue Service, by taxing authorities throughout the world, and by many state and local jurisdictions throughout the U.S. The following table summarizes the status of significant income tax examinations of JPMorgan Chase and its consolidated subsidiaries as of December 31, 2022.

	Periods under examination	Status
JPMorgan Chase – U.S.	2011 – 2013	Field examination of amended returns
JPMorgan Chase – U.S.	2014 - 2018	Field examination of original and amended returns
JPMorgan Chase – New York State	2012 - 2014	Field Examination
JPMorgan Chase – New York City	2015 - 2017	Field Examination
JPMorgan Chase – U.K.	2011 – 2020	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 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 activities are 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)		2022		2021
Segregated for the benefit of securities and cleared derivative customers	**$**	**8.5**	$	8.6
Cash reserves at non-U.S. central banks and held for other general purposes		**8.1**		5.1
Total restricted cash[(a)]	**$**	**16.6**	$	13.7

(a) Comprises $15.2 billion and $12.5 billion in deposits with banks and $1.4 billion and $1.2 billion in cash and due from banks on the Consolidated balance sheets as of December 31, 2022 and 2021, respectively.

Also, as of December 31, 2022 and 2021, the Bank had cash pledged with clearing organizations for the benefit of customers of $7.0 billion and $6.4 billion, respectively.

Intercompany funds transfers

Restrictions imposed by U.S. federal law prohibit the Bank from lending to JPMorgan Chase & Co. and certain of its affiliates 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"), must be made on terms and conditions that are consistent with safe and sound banking practices. In addition, unless collateralized with cash or US Government debt obligations, covered transactions are generally limited to 10% of the 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, 2023, the Bank could pay, in the aggregate, approximately $34 billion in dividends to JPMorgan Chase without the prior approval of its relevant banking regulators. The capacity to pay dividends in 2023 will be supplemented by the Bank's earnings during the year.

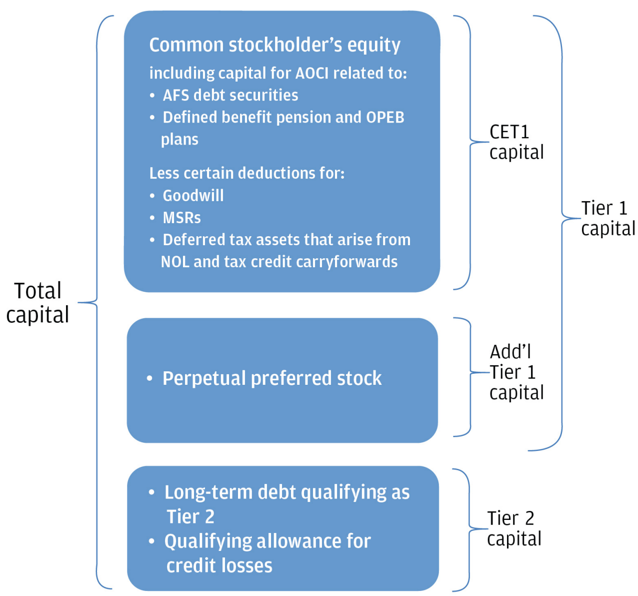
Note 25 – Regulatory capital

The Bank's banking regulator, the OCC, establishes capital requirements, including well-capitalized requirements 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. The minimum amount of regulatory capital that must be held by banks is determined by calculating risk-weighted assets ("RWA"), which are on-balance sheet assets and off-balance sheet exposures, weighted according to risk. Two comprehensive approaches are prescribed for calculating RWA: a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). For each of the risk-based capital ratios, the capital adequacy of the Bank is evaluated against the lower of the Standardized or Advanced approaches compared to their respective regulatory capital ratio requirements.

The three components of regulatory capital under the Basel III rules are as illustrated below:



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 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 requirements

All banking institutions are currently required to have a minimum CET1 capital ratio of 4.5% of risk-weighted assets.

Certain banking organizations, including JPMorgan Chase Bank, N.A. are required to hold additional levels 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 incorporates a fixed capital conservation buffer of 2.5% and a discretionary countercyclical capital buffer.

The U.S. federal regulatory capital standards include a framework for setting a discretionary countercyclical capital buffer taking into account the macro financial environment in which large, internationally active banks function. As of December 31, 2022, 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 will result in limitations to the amount of capital that the Bank may distribute, as well as certain executive discretionary bonus payments.

Under the risk-based capital and leverage-based guidelines of the OCC, the Bank is required to maintain minimum ratios for CET1 capital, Tier 1 capital, Total capital, Tier 1 leverage and the SLR. Failure to meet these minimum requirements could cause the OCC to take action.

The following table presents the risk-based and leverage-based regulatory capital ratio requirements and well-capitalized ratios to which the Bank was subject as of December 31, 2022 and 2021.

	Capital ratio requirements[(a)(b)]	Well-capitalized ratios[(c)]
Risk-based capital ratios		
CET1 capital	7.0 %	6.5 %
Tier 1 capital	8.5	8.0
Total capital	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 minimum SLR requirement of 3.0%, as well as, supplementary leverage buffer requirement of 3.0% for the Bank.
(b) Represents the regulatory capital ratio requirements applicable to the Bank under Basel III. The CET1, Tier 1 and Total capital ratio requirements include a fixed capital conservation buffer requirement of 2.5%.
(c) Represents requirements for the Bank pursuant to regulations issued under the FDIC Improvement Act.

CECL regulatory capital transition

Until December 31, 2021, the Bank's capital reflected a two year delay of the effects of CECL provided by the Federal Reserve Board in response to the COVID-19 pandemic.

Beginning January 1, 2022, the $2.9 billion CECL capital benefit is being phased out at 25% per year over a three-year period. As of December 31, 2022, the Bank's CET1 capital reflected the remaining $2.2 billion benefit associated with the CECL capital transition provisions.

Additionally, effective January 1, 2022, the Bank phased out 25% of the other CECL capital transition provisions which impacted Tier 2 capital, adjusted average assets, total leverage exposure and RWA, as applicable.

Refer to Note 1 for further information on the CECL accounting guidance.

The following tables present risk-based capital metrics under both the Basel III Standardized and Basel III Advanced approaches and leverage-based capital metrics for the Bank. As of December 31, 2022 and 2021, the Bank was well-capitalized and met all capital requirements to which it was subject.

	Basel III Standardized		**Basel III Advanced**	
(in millions, except ratios)	**Dec 31, 2022**	Dec 31, 2021	**Dec 31, 2022**	Dec 31, 2021
Risk-based capital metrics[(a)]:				
CET1 capital	**$ 269,668**	$ 266,907	**$ 269,668**	$ 266,907
Tier 1 capital	**269,672**	266,910	**269,672**	266,910
Total capital	**288,433**	281,826	**275,255**	272,299
Risk-weighted assets	**1,597,072**	1,582,280	**1,475,602**	1,392,847
CET1 capital ratio	**16.9 %**	16.9 %	**18.3 %**	19.2 %
Tier 1 capital ratio	**16.9**	16.9	**18.3**	19.2
Total capital ratio	**18.1**	17.8	**18.7**	19.5

(a) The capital metrics reflect the CECL capital transition provisions.

Three months ended (in millions, except ratios)	**Dec 31, 2022**	Dec 31, 2021
Leverage-based capital metrics[(a)]:		
Adjusted average assets[(b)]	**$ 3,249,912**	$ 3,334,925
Tier 1 leverage ratio	**8.3 %**	8.0 %
Total leverage exposure	**$ 3,925,502**	$ 4,119,286
SLR	**6.9 %**	6.5 %

(a) The capital metrics reflect the CECL capital transition provisions.
(b) Adjusted average assets, for purposes of calculating the leverage ratios, includes quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill, inclusive of estimated equity method goodwill, and other intangible assets.

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 have historically been refinanced, extended, cancelled, or expired without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Bank's view, representative of its expected future credit exposure or funding requirements.

To provide for expected credit losses in wholesale and certain consumer lending-related commitments, an allowance for credit losses on lending-related commitments is maintained. Refer to Note 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, 2022 and 2021. 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

	Contractual amount						Carrying value[l]	
	2022					2021	2022	2021
By remaining maturity at December 31, (in millions)	Expires in 1 year or less	Expires after 1 year through 3 years	Expires after 3 years through 5 years	Expires after 5 years	Total	Total		
Lending-related								
Consumer, excluding credit card:								
Residential real estate[a]	**$ 5,156**	**$ 3,500**	**$ 6,542**	**$ 6,089**	**$ 21,287**	$ 32,996	**$ 75**	$ 100
Auto and other	**10,642**	**1**	**–**	**1,588**	**12,231**	12,338	**–**	2
Total consumer, excluding credit card	**15,798**	**3,501**	**6,542**	**7,677**	**33,518**	45,334	**75**	102
Credit card[b]	**821,284**	**–**	**–**	**–**	**821,284**	730,534	**–**	–
Total consumer[c]	**837,082**	**3,501**	**6,542**	**7,677**	**854,802**	775,868	**75**	102
Wholesale:								
Other unfunded commitments to extend credit[d]	**81,133**	**132,212**	**201,449**	**22,417**	**437,211**	450,086	**2,298** [k]	1,991
Standby letters of credit and other financial guarantees[d][e]	**13,578**	**8,272**	**4,581**	**1,024**	**27,455**	28,543	**408**	476
Other letters of credit[d]	**3,692**	**343**	**98**	**1**	**4,134**	4,448	**6**	9
Total wholesale[c]	**98,403**	**140,827**	**206,128**	**23,442**	**468,800**	483,077	**2,712**	2,476
Total lending-related	**$ 935,485**	**$ 144,328**	**$ 212,670**	**$ 31,119**	**$1,323,602**	$1,258,945	**$ 2,787**	$2,578
Other guarantees and commitments								
Securities lending indemnification agreements and guarantees[f]	**$ 312,261**	**$ –**	**$ –**	**$ –**	**$ 312,261**	$ 362,660	**$ –**	$ –
Derivatives qualifying as guarantees	**5,164**	**466**	**12,632**	**41,000**	**59,262**	55,824	**652**	494
Unsettled resale and securities borrowed agreements[g]	**81,979**	**715**	**–**	**–**	**82,694**	66,258	**(3)**	1
Unsettled repurchase and securities loaned agreements[h]	**52,787**	**534**	**–**	**–**	**53,321**	59,978	**(3)**	–
Loan sale and securitization-related indemnifications:								
Mortgage repurchase liability	**NA**	**NA**	**NA**	**NA**	**NA**	NA	**76**	61
Loans sold with recourse	**NA**	**NA**	**NA**	**NA**	**631**	601	**11**	12
Exchange & clearing house guarantees and commitments[i]	**43,641**	**–**	**–**		**43,641**	55,966	**–**	–
Other guarantees and commitments[j]	**3,652**	**171**	**114**	**2,335**	**6,272**	5,470	**53**	69

(a) Includes certain commitments to purchase loans from correspondents.
(b) Also includes commercial card lending-related commitments.
(c) Predominantly all consumer and wholesale lending-related commitments are in the U.S.
(d) At December 31, 2022 and 2021, reflected the contractual amount net of risk participations totaling $71 million and $44 million, respectively, for other unfunded commitments to extend credit; $8.2 billion and $7.9 billion, respectively, for standby letters of credit and other financial guarantees; and $512 million and $451 million, respectively, for other letters of credit. In regulatory filings with the Federal Reserve these commitments are shown gross of risk participations.
(e) At December 31, 2022 and 2021, included commitments to JPMorgan Chase affiliates of $19 million and $13 million.
(f) At December 31, 2022 and 2021, collateral held by the Bank in support of securities lending indemnification agreements was $328.2 billion and $383.0 billion, respectively. Total securities lending indemnification agreements and guarantees included balances with JPMorgan Chase affiliates of $28.9 billion and $24.9 billion at December 31, 2022 and 2021, respectively. Collateral held by the Bank in support of securities lending indemnification agreements with JPMorgan Chase affiliates was $29.6 billion and $25.6 billion at December 31, 2022 and 2021, respectively. Securities lending collateral primarily consists of cash, G7 government securities, and securities issued by U.S. GSEs and government agencies.
(g) At December 31, 2022 and 2021, included $35 million and $3.1 billion of unsettled resale and securities borrowed agreements with JPMorgan Chase affiliates.
(h) At December 31, 2022 and 2021, included $128 million and $311 million of unsettled repurchase and securities loaned agreements with JPMorgan Chase affiliates.
(i) At December 31, 2022 and 2021, included 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.
(j) At December 31, 2022 and 2021, primarily includes, unfunded commitments related to certain tax-oriented equity investments, unfunded commitments to purchase secondary market loans and other equity investment commitments.
(k) At December 31, 2022, includes net markdowns on held-for-sale positions related to unfunded commitments in the bridge financing portfolio.
(l) For lending-related products, the carrying value represents the allowance for lending-related commitments and the guarantee liability; for derivative-related products and lending-related commitments for which the fair value option was elected, the carrying value represents the fair value.

Other unfunded commitments to extend credit

Other unfunded commitments to extend credit generally consist of commitments for working capital and general corporate purposes, extensions of credit to support commercial paper facilities and bond financings in the event that those obligations cannot be remarketed to new investors, as well as committed liquidity facilities to clearing organizations. The 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 non-contingent obligation assumed (e.g., the amount of consideration received or the net present value of the premium receivable). For these obligations, 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. The lending-related contingent obligation is recognized based on expected credit losses in addition to, and separate from, any non-contingent obligation.

Non-lending-related contingent obligations are recognized when the liability becomes probable and reasonably estimable. These obligations are not recognized if the estimated amount is less than the carrying amount of any non-contingent liability recognized at inception (adjusted for any amortization). Examples of non-lending-related contingent obligations include indemnifications provided in sales agreements, where a portion of the sale proceeds is allocated to the guarantee, which adjusts the gain or loss that would otherwise result from the transaction. For these indemnifications, the initial liability is amortized to income as the Bank's risk is reduced (i.e., over time or when the indemnification expires).

The contractual amount and carrying value of guarantees and indemnifications are included in the table on page 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 financings 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, 2022 and 2021.

Standby letters of credit, other financial guarantees and other letters of credit

	2022		2021	
December 31, (in millions)	Standby letters of credit and other financial guarantees	Other letters of credit	Standby letters of credit and other financial guarantees	Other letters of credit
Investment-grade[(a)]	**$ 19,224**	**$ 3,040**	$ 20,011	$ 3,087
Noninvestment-grade[(a)]	**8,231**	**1,094**	8,532	1,361
Total contractual amount	**$ 27,455**	**$ 4,134**	$ 28,543	$ 4,448
Allowance for lending-related commitments	**$ 82**	**$ 6**	$ 123	$ 9
Guarantee liability	**326**	**–**	353	–
Total carrying value	**$ 408**	**$ 6**	$ 476	$ 9
Commitments with collateral	**$ 15,293**	**$ 795**	$ 14,511	$ 999

(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 derivative 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, 2022 and 2021.

(in millions)	**December 31, 2022**	December 31, 2021
Notional amounts		
Derivative guarantees	**$ 59,262**	$ 55,824
Stable value contracts with contractually limited exposure	**31,820**	29,778
Maximum exposure of stable value contracts with contractually limited exposure	**2,063**	2,882
Fair value		
Derivative payables	**652**	494

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.

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. The unpaid principal balance of loans sold with recourse as well as 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, are disclosed in the table on page 119.

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, in its role as a merchant acquirer, the Bank's Merchant Services business in Payments 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 the Bank related to charge-backs.

For the years ended December 31, 2022, 2021 and 2020, the Bank processed an aggregate volume of $2,158.4 billion, $1,886.7 billion, and $1,597.3 billion, respectively.

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
The Bank acts as a sponsoring member to clear eligible overnight and term resale and repurchase agreements through the Government Securities Division of the Fixed Income Clearing Corporation ("FICC") on behalf of clients that become sponsored members under the FICC's rules. The 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 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, 2022 and 2021, 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.

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 from 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)		2022		2021
Assets that may be sold or repledged or otherwise used by secured parties	**$**	**57.2**	$	82.2
Assets that may not be sold or repledged or otherwise used by secured parties		**43.3**		65.9
Assets pledged at Federal Reserve banks and FHLBs		**567.6**		476.4
Total pledged assets	**$**	**668.1**	$	624.5

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)		2022		2021
Investment securities	**$**	**110.5**	$	93.0 (a)
Loans		**485.9**		428.4
Trading assets and other		**71.7**		103.1 (a)
Total pledged assets	**$**	**668.1**	$	624.5

(a) Prior-period amounts have been revised to conform with the current presentation.

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)		2022		2021
Collateral permitted to be sold or repledged, delivered, or otherwise used	**$**	**710.6**	$	779.0
Collateral sold, repledged, delivered or otherwise used		**522.7**		571.0

Note 28 - Litigation

Contingencies

As of December 31, 2022, JPMorgan Chase and its subsidiaries, including but not limited to JPMorgan Chase Bank, N.A., are defendants or respondents in numerous legal proceedings, including private, civil litigations, government investigations or regulatory enforcement matters. The litigations range from individual actions involving a single plaintiff to class action lawsuits with potentially millions of class members. Investigations and regulatory enforcement matters involve both formal and informal proceedings, by both governmental agencies and self-regulatory organizations. These legal proceedings are at varying stages of adjudication, arbitration or investigation, and involve each of 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 $1.2 billion at December 31, 2022. 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 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.

1MDB Litigation. J.P. Morgan (Suisse) SA was named as a defendant in a civil litigation filed in May 2021 in Malaysia by 1Malaysia Development Berhad ("1MDB"), a Malaysian state-owned and controlled investment fund. J.P. Morgan (Suisse) SA was served in August 2022. The claim alleges "dishonest assistance" against J.P. Morgan (Suisse) SA in relation to payments of $300 million and $500 million, from 2009 and 2010, respectively, received from 1MDB and paid into an account at J.P. Morgan Suisse (SA) held by 1MDB PetroSaudi Limited, a joint venture company between 1MDB and PetroSaudi Holdings (Cayman) Limited. In September 2022, JPMorgan Chase filed an application challenging the validity of service and the Malaysian court's jurisdiction to hear the claim.

Amrapali. India's Enforcement Directorate ("ED") is investigating J.P. Morgan India Private Limited in connection with investments made in 2010 and 2012 by two offshore funds formerly managed by JPMorgan Chase entities into residential housing projects developed by the Amrapali Group ("Amrapali"). In 2017, numerous creditors filed civil claims against Amrapali, including petitions brought by home buyers relating to delays in delivering or failure to deliver residential units. The home buyers' petitions have been overseen by the Supreme Court of India and are ongoing. In August 2021, the ED issued an order fining J.P. Morgan India Private Limited approximately $31.5 million. JPMorgan Chase is appealing the order and the fine. Relatedly, in July 2019, the Supreme Court of India issued an order making preliminary findings that Amrapali and other parties, including unspecified JPMorgan Chase entities and the offshore funds that had invested in the projects, violated certain currency control and money laundering provisions, and ordering the ED to conduct a further inquiry under India's Prevention of Money Laundering Act ("PMLA") and Foreign Exchange Management Act ("FEMA"). In May 2020, the ED attached approximately $25 million from J.P. Morgan India Private Limited in connection with the criminal PMLA investigation. The JPMorgan Chase is responding to and cooperating with the PMLA investigation.

Federal Republic of Nigeria Litigation. JPMorgan Chase Bank, N.A. operated an escrow and depository account for the Federal Government of Nigeria ("FGN") and two major international oil companies. The account held approximately $1.1 billion in connection with a dispute among the clients over rights to an oil field. Following the settlement of the dispute, JPMorgan Chase Bank, N.A. paid out the monies in the account in 2011 and 2013 in accordance with directions received from its clients. In November 2017, the Federal Republic of Nigeria ("FRN") commenced a claim in the English High Court for approximately $875 million in payments made out of the accounts. The FRN alleged 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. A trial was held between February and April 2022. In June 2022, the Court decided the case in favor of JPMorgan Chase Bank, N.A. and dismissed it in full. In November 2022, the Court refused permission to the FRN to appeal the dismissal, and the matter was concluded.

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. Among those resolutions, in May 2015, the JPMorgan Chase pleaded guilty to a single violation of federal antitrust law. The Department of Labor ("DOL") granted JPMorgan Chase exemptions that permit JPMorgan Chase and its affiliates to continue to rely on the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act ("ERISA") through the ten-year disqualification period following the antitrust plea. The only remaining FX-related governmental inquiry is a South Africa Competition Commission matter which is currently pending before the South Africa Competition Tribunal.

With respect to civil litigation matters, in August 2018, the United States District Court for the Southern District of New York granted final approval to 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. Although certain members of the settlement class filed requests to the Court to be excluded from the class, an agreement to resolve their claims was reached in December 2022. A putative class action remains pending against JPMorgan Chase and other foreign exchange dealers on behalf of certain consumers who purchased foreign currencies at allegedly inflated rates. In addition, some FX-related individual and putative class actions based on similar alleged underlying conduct have been filed outside the U.S., including in the U.K., Israel, the Netherlands, Brazil and Australia. An agreement to resolve one of the UK actions was reached in December 2022. In a putative class action pending before the U.K. Competition Appeal Tribunal, proposed class representatives have appealed the tribunal's denial of a request for class certification on an opt-out basis. In Israel, a settlement in principle has been reached in the putative class action, which remains subject to court approval.

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, but that settlement was reversed on appeal and remanded to the United States District Court for the Eastern District of New York.

The original class action was divided into two separate actions, one seeking primarily monetary relief and the other seeking primarily injunctive relief. In September 2018, the parties to the monetary class action finalized an agreement which amends and supersedes the prior settlement agreement. Pursuant to this settlement, the defendants collectively contributed an additional $900 million to the approximately $5.3 billion previously held in escrow from the original settlement. In December 2019, the amended settlement agreement was approved by the District Court. Certain merchants appealed the District Court's approval order, and those appeals are pending. Based on the percentage of merchants that opted out of the amended class settlement, $700 million has been returned to the defendants from the settlement escrow in accordance with the settlement agreement. The injunctive class action continues separately, and in September 2021, the District Court granted plaintiffs' motion for class certification in part, and denied the motion in part.

Of the merchants who opted out of the amended damages class settlement, certain merchants filed individual actions raising similar allegations against Visa and Mastercard, as well as against JPMorgan Chase and other banks. While some of those actions remain pending, the defendants have reached settlements with the merchants who opted out representing over half of the combined Mastercard-branded and Visa-branded payment card sales volume.

Jeffrey Epstein Litigation. JPMorgan Chase Bank, N.A. is named as a defendant in two lawsuits filed in the United States District Court for the Southern District of New York which allege that JPMorgan Chase Bank, N.A. knowingly facilitated Jeffrey Epstein's sex trafficking and other unlawful conduct by providing banking services to Epstein until 2013. One case, which was filed in November 2022, is a putative class action filed by an alleged sex-trafficking victim of Epstein, and the other case, which was filed in December 2022, was brought on behalf of the government of the United States Virgin Islands and also alleges certain Virgin Islands statutory claims. JPMorgan Chase Bank, N.A. has moved to dismiss both complaints.

LIBOR and Other Benchmark Rate Investigations and Litigation. JPMorgan Chase has responded to inquiries from various governmental agencies and entities around the world relating primarily to the British Bankers Association's ("BBA") London Interbank Offered Rate ("LIBOR") for various currencies and the European Banking Federation's Euro Interbank Offered Rate ("EURIBOR"). The Swiss Competition Commission's investigation relating to EURIBOR, to which JPMorgan Chase and one other bank remain 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 various individual and putative class actions related to benchmark rates, including U.S. dollar LIBOR. In actions related to U.S. dollar LIBOR during the period that it was administered by the BBA, JPMorgan Chase has obtained dismissal of certain actions and resolved certain other actions, and others are in various stages of litigation. The United States District Court for the Southern District of New York has granted class certification of antitrust claims related to bonds and interest rate swaps sold directly by the defendants, including JPMorgan Chase. A consolidated putative class action related to the period that U.S. dollar LIBOR was administered by ICE Benchmark Administration has been dismissed. In addition, a group of individual plaintiffs filed a lawsuit asserting antitrust claims, alleging that JPMorgan Chase and other defendants were engaged in an unlawful agreement to set U.S. dollar LIBOR and conspired to monopolize the market for LIBOR-based consumer loans and credit cards. In September 2022, the Court dismissed plaintiffs' complaint in its entirety, and plaintiffs filed an amended complaint asserting similar antitrust claims, which defendants have moved to dismiss. JPMorgan Chase's settlements of putative class actions related to the Singapore Interbank Offered Rate and the Singapore Swap Offer Rate, and the Australian Bank Bill Swap Reference Rate received final court approval in November 2022, while the settlement related to Swiss franc LIBOR remains subject to court approval.

Securities Lending Antitrust Litigation. JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC, J.P. Morgan Prime, Inc., and J.P. Morgan Strategic Securities Lending Corp. are named as defendants in a putative class action filed in the United States District Court for the Southern District of New York. The complaint asserts violations of federal antitrust law and New York State common law in connection with an alleged conspiracy to prevent the emergence of anonymous exchange trading for securities lending transactions. Defendants' motion to dismiss the complaint was denied. Plaintiffs have moved to certify a class in this action, which defendants are opposing.

Shareholder Litigation. Several shareholder putative class actions, as well as shareholder derivative actions purporting to act on behalf of JPMorgan Chase, have been filed against JPMorgan Chase, its Board of Directors and certain of its current and former officers.

Certain of these shareholder suits relate to historical trading practices by former employees in the precious metals and U.S. treasuries markets and related conduct which were the subject of JPMorgan Chase's resolutions with the DOJ, CFTC and SEC in September 2020, and fiduciary activities that were separately the subject of a resolution between JPMorgan Chase Bank, N.A. and the OCC in November 2020. One of these shareholder derivative suits was filed in the Supreme Court of the State of New York in May 2022, asserting breach of fiduciary duty and unjust enrichment claims relating to the historical trading practices and related conduct and fiduciary activities which were the subject of the resolutions described above. In December 2022, the court granted defendants' motion to dismiss this action in full. A second shareholder derivative action was filed in the United States District Court for the Eastern District of New York in December 2022 relating to the historical trading practices and related conduct, which asserts breach of fiduciary duty and contribution claims and alleges that the shareholder is excused from making a demand to commence litigation because such a demand would have been futile. In addition, a consolidated putative class action is pending in the United States District Court for the Eastern District of New York on behalf of shareholders who acquired shares of JPMorgan Chase common stock during the putative class period, alleging that certain SEC filings of JPMorgan Chase were materially false or misleading because they did not disclose certain information relating to the historical trading practices and conduct. Defendants have moved to dismiss the amended complaint in this action.

A separate shareholder derivative suit was filed in March 2022 in the United States District Court for the Eastern District of New York asserting breaches of fiduciary duty and violations of federal securities laws based on the alleged failure of the Board of Directors to exercise adequate oversight over JPMorgan Chase's compliance with records preservation requirements which were the subject of resolutions between certain of JPMorgan Chase's subsidiaries and the SEC and the CFTC. Defendants' motion to dismiss the amended complaint is pending.

* * *

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, upward or downward, as appropriate, based on management's best judgment after consultation with counsel. JPMorgan Chase Bank, N.A.,'s legal expense was $54 million, $90 million and $793 million for the years ended December 31, 2022, 2021 and 2020, 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 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.

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. There were no significant internal transfers of legal entities between the Bank and JPMorgan Chase for the years ended December 31, 2022, 2021 and 2020.

Subsequent events

The Bank has performed an evaluation of events that have occurred subsequent to December 31, 2022, and through February 21, 2023 (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, 2022.

Glossary of Terms and Acronyms

ABS: Asset-backed securities

AFS: Available-for-sale

Amortized cost: Amount at which a financing receivable or investment is originated or acquired, adjusted for accretion or amortization of premium, discount, and net deferred fees or costs, collection of cash, charge-offs, foreign exchange, and fair value hedge accounting adjustments. For AFS securities, amortized cost is also reduced by any impairment losses recognized in earnings. Amortized cost is not reduced by the allowance for credit losses, except where explicitly presented net.

AOCI: Accumulated other comprehensive income/(loss)

ARM: Adjustable rate mortgage(s)

Bank: JPMorgan Chase Bank N.A.

BBL: Barrel

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.

CCP: "Central counterparty" is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes a counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement.

CDS: Credit default swaps

CECL: Current Expected Credit Losses

CET1 Capital: Common equity Tier 1 capital

CFO: Chief Financial Officer

CLO: Collateralized loan obligations

Collateral-dependent: A loan is considered to be collateral-dependent when repayment of the loan is expected to be provided substantially through the operation or sale of the collateral when the borrower is experiencing financial difficulty, including when foreclosure is deemed probable based on borrower delinquency.

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

Embedded derivatives: 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.

ETD: "Exchange-traded derivatives" are derivative contracts that are executed on an exchange and settled via a central clearing house.

EU: European Union

Fannie Mae: Federal National Mortgage Association

FASB: Financial Accounting Standards Board

FCA: Financial Conduct Authority

FDIC: Federal Deposit Insurance Corporation

Federal Reserve: The Board of the Governors of the Federal Reserve System

FFIEC: Federal Financial Institutions Examination Council

FHA: Federal Housing Administration

FHLB: Federal Home Loan Bank

FICC: The Fixed Income Clearing Corporation

FICO score: A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the credit bureaus.

Freddie Mac: Federal Home Loan Mortgage Corporation

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.

FTC: Foreign tax credit

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

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

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.

JPMorgan Chase: JPMorgan Chase & Co.

LGD: Loss given default

LIBOR: London Interbank Offered Rate

LLC: Limited Liability Company

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 Loan-To-Value 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).

MBS: Mortgage-backed securities

Measurement alternative: Measures equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer.

Merchant Services: offers merchants payment processing capabilities, fraud and risk management, data and analytics, and other payments services. Through Merchant Services, merchants of all sizes can accept payments via credit and debit cards and payments in multiple currencies.

MEV: Macroeconomic variable

MMBTU: One million British thermal units

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.

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 charge-off/(recovery) rate: Represents net charge-offs/(recoveries) (annualized) divided by average retained loans for the reporting period.

Net interchange income includes the following components:

- **Interchange income**: Fees earned by credit and debit card issuers on sales transactions.
- **Reward costs**: The cost to the Bank for points earned by cardholders enrolled in credit card rewards programs generally tied to sales transactions.
- **Partner payments**: Payments to co-brand credit card partners based on the cost of loyalty program rewards earned by cardholders on credit card transactions.

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

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

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.

PCD: **"Purchased credit deteriorated"** assets represent acquired financial assets that as of the date of acquisition have experienced a more-than-insignificant deterioration in credit quality since origination, as determined by the Bank.

PD: Probability of default

PPP: Paycheck Protection Program under the Small Business Association ("SBA")

PRA: Prudential Regulation Authority

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, foreign exchange and interest rate risk.

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

PSUs: Performance share units

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

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 portfolios: Consumer loan portfolios that predominantly include residential real estate loans, credit card loans, auto loans to individuals and certain small business loans.

S&P: Standard and Poor's 500 Index

SA-CCR: Standardized Approach for Counterparty Credit Risk

SAR(s) as it pertains to employee stock awards: 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

SOFR: Secured Overnight Financing Rate

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, underlying reference pool of loans or other market variables. The notes typically contain embedded (but not separable or detachable) derivatives. Contractual cash flows for principal, interest, or both can vary in amount and timing throughout the life of the note based on non-traditional indexes or non-traditional uses of traditional interest rates or indexes.

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. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

U.K.: United Kingdom

Unaudited: Financial statements and/or information that have not been subject to auditing procedures by an independent registered public accounting firm.

U.S.: United States of America

U.S. GAAP: Accounting principles generally accepted in the U.S.

U.S. government agencies: U.S. government agencies include, but are not limited to, agencies such as Ginnie Mae and FHA, and do not include Fannie Mae and Freddie Mac which are U.S. government-sponsored enterprises ("U.S. GSEs"). In general, obligations of U.S. government agencies are fully and explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government in the event of a default.

U.S. GSE(s): "U.S. government-sponsored enterprises" are quasi-governmental, privately-held entities established or chartered by the U.S. government to serve public purposes as specified by the U.S. Congress to improve the flow of credit to specific sectors of the economy and provide certain essential services to the public. U.S. GSEs include Fannie Mae and Freddie Mac, but do not include Ginnie Mae or FHA. U.S. GSE obligations are not explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government.

U.S. Treasury: U.S. Department of the Treasury

VA: U.S. Department of Veterans Affairs

VCG: Valuation Control Group

VGF: Valuation Governance Forum

VIEs: Variable interest entities

Warehouse loans: Consist of prime mortgages originated with the intent to sell that are accounted for at fair value and classified as loans.

2） 業務及び財産の状況に関する事項（日本語訳抜粋）

ジェー・ピー・モルガン・チェース・バンク・ナショナル・アソシエーション

（ジェー・ピー・モルガン・チェース・アンド・カンパニー全額出資子会社）

業務概要

2022年12月31日終了事業年度

以下は、ジェー・ピー・モルガン・チェース・バンク・ナショナル・アソシエーションの2022年12月31日に終了した事業年度の業績の要約である。

純利益は、2021年度の381億ドルに対し、2022年度は9.8%減の343億ドルであった。純収益合計は2021年度の1,042億ドルに対し、2022年度は14.2%増の1,190億ドルとなった。

与信損失引当金額は、2021年度の93億ドルの戻入に対し、2022年度は168.3%増加し63億ドルの繰入となった。

利息以外の費用は、2021年度の644億ドルに対し、2022年度は6.7%増の687億ドルであった。法人所得税は2021年度の110億ドルに対し、2022年度は13.2%減の96億ドルとなった。

2022年12月31日現在、総資産は2021年から3.2%減の3.2兆ドルであった。2022年12月31日現在、総負債は2021年から3.5%減の2.9兆ドルであった。株主持分合計は、2021年度の3,028億ドルに対し、0.3%増の3,036億ドルとなった。

3）連結損益計算書及び連結貸借対照表

3.1 連結損益計算書

ジェー・ピー・モルガン・チェース・バンク・ナショナル・アソシエーション

（ジェー・ピー・モルガン・チェース・アンド・カンパニーの全額出資子会社）

12月31日終了事業年度（百万ドル）	2022年	2021年	2020年
収益			
投資銀行業務関連の収益	2,955	5,232	3,527
自己勘定取引	17,895	13,677	14,784
貸出金および預金関連収益	7,095	7,031	6,510
資産運用、管理および手数料	13,935	14,021	12,406
有価証券利益（損失）	(2,380)	(345)	802
モーゲージ報酬および関連利益	1,250	2,170	3,092
クレジットカード収益	4,421	5,102	4,435
その他の収益	5,384	5,511	5,931
利息以外の収益	50,555	52,399	51,487
受入利息	84,097	53,870	58,900
支払利息	15,675	2,064	4,987
正味受入利息	68,422	51,806	53,913
収益合計(純額)	118,977	104,205	105,400
与信損失引当金繰入額(戻入額)	6,347	(9,296)	17,483

3.1 連結損益計算書(続き)

ジェー・ピー・モルガン・チェース・バンク・ナショナル・アソシエーション
(ジェー・ピー・モルガン・チェース・アンド・カンパニーの全額出資子会社)

12月31日終了事業年度(百万ドル)	2022年	2021年	2020年
利息以外の費用			
報酬費用	34,000	31,212	28,725
不動産関連費用	4,469	4,313	4,249
テクノロジー、通信および機器関連費用	8,646	9,304	9,890
専門家報酬および外部業務委託費用	6,983	6,510	5,692
マーケティング費用	3,877	2,936	2,338
その他の費用	10,761	10,170	9,821
利息以外の費用合計	68,736	64,445	60,715
法人所得税控除前利益	43,894	49,056	27,202
法人所得税	9,552	11,001	6,170
当期純利益	34,342	38,055	21,032

3.2 連結貸借対照表

ジェー・ピー・モルガン・チェース・バンク・ナショナル・アソシエーション
(ジェー・ピー・モルガン・チェース・アンド・カンパニーの全額出資子会社)

12 月 31 日終了事業年度（百万ドル）	2022 年	2021 年
資産		
現金および無利息銀行預け金	27,258	25,657
有利息銀行預け金	538,715	713,660
フェデラル・ファンド貸出金および売戻条件付買入有価証券	259,460	227,457
借入有価証券	53,642	65,111
トレーディング資産	288,420	293,428
売却可能有価証券	205,790	308,318
満期保有目的有価証券	425,305	363,707
信用損失引当金控除後有価証券	631,095	672,025
貸出金	1,132,985	1,075,106
貸倒引当金	(19,714)	(16,378)
貸倒引当金控除後貸出金	1,113,271	1,058,728
未収利息および未収入金	89,373	76,345
土地・建物および設備	26,347	25,757
のれん・モーゲージ・サービシング権およびその他の無形固定資産	48,600	45,831
その他の資産	125,761	102,983
資産合計	3,201,942	3,306,982

3.2 連結貸借対照表(続き)

ジェー・ピー・モルガン・チェース・バンク・ナショナル・アソシエーション
(ジェー・ピー・モルガン・チェース・アンド・カンパニーの全額出資子会社)

12月31日終了事業年度（百万ドル）	2022年	2021年
負債		
預金	2,440,722	2,549,631
フェデラル・ファンド借入金および買戻条件付貸付または売却有価証券	85,902	102,266
短期借入金	10,074	13,423
トレーディング負債	116,629	111,017
未払金およびその他の負債	156,433	133,034
連結変動持分事業体により発行された受益権	13,424	10,721
長期社債	75,138	84,042
負債合計	2,898,322	3,004,134

3.2 連結貸借対照表(続き)

ジェー・ピー・モルガン・チェース・バンク・ナショナル・アソシエーション
(ジェー・ピー・モルガン・チェース・アンド・カンパニーの全額出資子会社)

12月31日終了事業年度(百万ドル)	2022年	2021年
株主持分		
優先株式	-	-
普通株式	2,028	2,028
資本剰余金	118,293	118,221
利益剰余金	201,263	182,421
その他の包括利益累計額	(17,964)	178
株主持分合計	303,620	302,848
負債および株主持分合計	3,201,942	3,306,982