

The Goldman Sachs Group, Inc.

PILLAR 3 DISCLOSURES

For the year ended December 31, 2022

TABLE OF CONTENTS

	Page No.
Introduction	2
Regulatory Capital	5
Capital Structure	6
Risk-Weighted Assets	7
Credit Risk	8
Equity Exposures in the Banking Book	14
Securitizations in the Banking Book	17
Market Risk	20
Operational Risk	25
Model Risk	26
Interest Rate Sensitivity	27
Forward-Looking Statements	28
Index of References	29

INDEX OF TABLES

	Page No.
Table 1 Risk-Based Capital and Leverage Requirements	5
Table 2 Risk-Based Capital and Leverage Ratios	5
Table 3 Capital Structure	6
Table 4 RWAs by Exposure Category	7
Table 5 Credit Risk Wholesale Exposures by PD Band	11
Table 6 Credit Risk Retail Exposures by PD Band	12
Table 7 Equity Exposures in the Banking Book	16
Table 8 Securitization Exposures and Related RWAs by Exposure Type	19
Table 9 Securitization Exposures and Related RWAs by Regulatory Capital Approach	19
Table 10 Securitization Activity - Banking Book	20
Table 11 Regulatory VaR	21
Table 12 Stressed VaR	22
Table 13 Incremental Risk	22
Table 14 Comprehensive Risk	22
Table 15 Daily Regulatory VaR	23
Table 16 Specific Risk	24
Table 17 Trading Book Securitization Exposures	24

Introduction

Overview

The Goldman Sachs Group, Inc. (Group Inc. or parent company), a Delaware corporation, together with its consolidated subsidiaries (collectively, the firm), is a leading global financial institution that delivers a broad range of financial services to a large and diversified client base that includes corporations, financial institutions, governments and individuals.

The Board of Governors of the Federal Reserve System (FRB) is the primary regulator of Group Inc., a bank holding company (BHC) under the U.S. Bank Holding Company Act of 1956 and a financial holding company under amendments to this Act. The firm is subject to consolidated regulatory capital requirements which are calculated in accordance with the regulations of the FRB (Capital Framework).

The capital requirements are expressed as risk-based capital and leverage ratios that compare measures of regulatory capital to risk-weighted assets (RWAs), average assets and off-balance sheet exposures. Failure to comply with these capital requirements would result in restrictions being imposed by the firm's regulators and could limit the firm's ability to repurchase shares, pay dividends and make certain discretionary compensation payments. The firm's capital levels are also subject to qualitative judgments by the regulators about components of capital, risk weightings and other factors.

The Capital Framework, as described below, requires disclosures based on the third pillar of Basel III (Pillar 3). The purpose of Pillar 3 disclosures is to provide information about banking institutions' risk management practices and regulatory capital ratios. This document is designed to satisfy these requirements and should be read in conjunction with the firm's most recent Annual Report on Form 10-K and FFIEC 101 Report, "Regulatory Capital Reporting for Institutions Subject to the Advanced Capital Adequacy Framework." References to the "2022 Form 10-K" are to the firm's Annual Report on Form 10-K for the year ended December 31, 2022. All references to December 2022 and December 2021 refer to the periods ended, or the dates, as the context requires, December 31, 2022 and December 31, 2021, respectively. References to the FFIEC 101 Report refer to the firm's report filed for the period ended December 31, 2022, available on the National Information Center's website located at www.ffiec.gov.

Capital Framework

The regulations under the Capital Framework are largely based on the Basel Committee on Banking Supervision's (Basel Committee) capital framework for strengthening international capital standards (Basel III) and also implement certain provisions of the U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act). Under the Capital Framework, the firm is an "Advanced approaches" banking organization and has been designated as a global systemically important bank (G-SIB).

The Capital Framework includes the minimum risk-based capital and the capital conservation buffer requirements. The buffer must consist entirely of capital that qualifies as Common Equity Tier 1 (CET1) capital.

The firm calculates its CET1 capital, Tier 1 capital and Total capital ratios in accordance with both the Standardized and Advanced Capital Rules. Each of the ratios calculated under the Standardized and Advanced Capital Rules must meet its respective capital requirements.

Under the Capital Framework, the firm is also subject to leverage requirements which consist of a minimum Tier 1 leverage ratio and a minimum supplementary leverage ratio (SLR), as well as the SLR buffer.

As of December 2022, the firm's Standardized ratios were 15.0% for CET1 capital, 16.6% for Tier 1 capital and 19.1% for Total capital. See Note 20 "Regulation and Capital Adequacy" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for further information about the firm's Standardized capital ratios and ratio requirements.

The Advanced Capital Rules require an Advanced approaches BHC to meet a series of qualification requirements on an ongoing basis. They also require notification to supervisors of any change to a model that results in a material change in its RWAs, or of any significant change to its modeling assumptions. These qualification requirements address the following areas: the BHC's governance processes and systems for maintaining adequate capital commensurate with its risk profile; its internal systems for segmenting exposures and applying risk weights; its quantification of risk parameters used, including its model-based estimates of exposures; its operational risk management processes, data management and quantification systems; the data management systems that are designed to support the timely and accurate reporting of risk-based capital requirements; and the control, oversight and validation mechanisms exercised by senior management and by the Board of Directors of Group Inc. (Board).

Pillar 3 Disclosures

The information presented in this document is calculated in accordance with the Capital Framework, with RWAs calculated in accordance with the Advanced Capital Rules, unless otherwise specified.

Definition of RWAs. As of December 2022, RWAs were calculated in accordance with both the Standardized and Advanced Capital Rules.

See Note 20 “Regulation and Capital Adequacy” in Part II, Item 8 “Financial Statements and Supplementary Data” in the 2022 Form 10-K for further information about the Capital Framework and the requirement to calculate RWAs in accordance with both the Standardized and Advanced Capital Rules. Also, see “Regulation” in Part I, Item 1 “Business” in the 2022 Form 10-K for further information about regulatory capital requirements.

Basis of Consolidation

The Pillar 3 disclosures and the firm’s regulatory capital ratio calculations are prepared at the consolidated Group Inc. level. The firm’s consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States (U.S. GAAP) and include the accounts of Group Inc. and all other entities in which the firm has a controlling financial interest. Intercompany transactions and balances have been eliminated. The scope of consolidation for regulatory capital purposes is substantially consistent with the firm’s U.S. GAAP consolidation.

See Note 2 “Basis of Presentation” and Note 3 “Significant Accounting Policies” in Part II, Item 8 “Financial Statements and Supplementary Data” in the 2022 Form 10-K for further information about the basis of presentation of the firm’s financial statements and policies on consolidation accounting.

Fair Value

Trading assets and liabilities, certain investments and loans, and certain other financial assets and liabilities, are included in the firm’s consolidated balance sheets at fair value (i.e., marked-to-market), with related gains or losses generally recognized in the consolidated statements of earnings and, therefore, in capital. The fair value of a financial instrument is the amount 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. The use of fair value to measure financial instruments is fundamental to the firm’s risk management practices and is the most critical accounting policy. The daily discipline of marking substantially all of the firm’s inventory to current market levels is an effective tool for assessing and managing risk and provides transparent and realistic insight into the firm’s inventory exposures. The use of fair value is an important aspect to consider when evaluating the firm’s capital base and capital ratios, as changes in the fair value of the firm’s positions are reflected in the current period’s shareholders’ equity, and accordingly, regulatory capital; it is also a factor used to determine the classification of positions into the banking book and trading book, as discussed further below.

See Note 3 “Significant Accounting Policies” in Part II, Item 8 “Financial Statements and Supplementary Data” and “Critical Accounting Policies – Fair Value” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for further information about the determination of fair value under U.S. GAAP and controls over valuation of financial instruments.

Banking Book/Trading Book Classification

In order to determine the appropriate regulatory capital treatment for the firm’s exposures, positions must be first classified as either banking book or trading book. Positions are classified as banking book unless they qualify to be classified as trading book.

Banking book positions are not generally held for the purpose of short-term resale or with the intent of benefiting from actual or expected short-term price movements or to lock in arbitrage profits. They may be accounted for at amortized cost, fair value or in accordance with the equity method. Banking book positions are subject to credit risk regulatory capital requirements. Credit risk represents the potential for loss due to the default or deterioration in credit quality of a counterparty (e.g., an over-the-counter (OTC) derivatives counterparty or a borrower) or an issuer of securities or other instruments the firm holds. See “Credit Risk” for further information.

Pillar 3 Disclosures

Trading book positions generally meet the following criteria: they are assets or liabilities that are accounted for at fair value; they are risk managed using a Value-at-Risk (VaR) internal model; and they are positions that the firm holds, generally as part of the market-making and underwriting businesses, for the purpose of short-term resale or with the intent of benefiting from actual or expected short-term price movements or to lock in arbitrage profits. In accordance with the Capital Framework, trading book positions are generally considered covered positions. Foreign exchange and commodity positions are also typically considered covered positions, whether or not they meet the other criteria for classification as trading book positions. Covered positions are subject to market risk regulatory capital requirements which are designed to cover the risk of loss in value of these positions due to changes in market conditions. See “Market Risk” for further information. Certain trading book positions, such as derivatives, are also subject to counterparty credit risk regulatory capital requirements.

Restrictions on the Transfer of Funds or Regulatory Capital within the Firm

Group Inc. is a holding company and, therefore, utilizes dividends, distributions and other payments from its subsidiaries to fund dividend payments and other payments on its obligations, including debt obligations. Regulatory capital requirements, as well as other provisions of applicable law and regulations, restrict Group Inc.’s ability to withdraw capital from its regulated subsidiaries.

See Note 20 “Regulation and Capital Adequacy” in Part II, Item 8 “Financial Statements and Supplementary Data” and “Risk Management – Liquidity Risk Management” and “Capital Management and Regulatory Capital” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for information about restrictions on the transfer of funds between Group Inc. and its subsidiaries.

Compliance with Capital Requirements

As of December 2022, none of Group Inc.’s consolidated subsidiaries that are subject to minimum regulatory capital requirements in a local jurisdiction had capital levels less than such requirements.

Goldman Sachs Bank USA (GS Bank USA), the firm’s primary U.S. bank subsidiary, is a New York State-chartered bank and a member of the Federal Reserve System, is supervised and regulated by the FRB, the FDIC, the New York State Department of Financial Services and the Consumer Financial Protection Bureau, and is subject to regulatory capital requirements that are calculated under the Capital Framework. GS Bank USA is an Advanced approaches banking organization under the Capital Framework. The deposits of GS Bank USA are insured by the FDIC to the extent provided by law.

See Note 20 “Regulation and Capital Adequacy” in Part II, Item 8 “Financial Statements and Supplementary Data” and “Capital Management and Regulatory Capital – Subsidiary Capital Requirements” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for information about GS Bank USA’s regulatory capital and leverage ratios, as well as other regulated subsidiaries. Reflecting the full impact of Current Expected Credit Losses (CECL) as of December 2022, GS Bank USA’s Advanced ratios would have been 16.8% for both CET1 capital and Tier 1 capital, and 18.8% for Total capital, and the Standardized ratios would have been 13.0% for both CET1 capital and Tier 1 capital, and 15.2% for Total capital.

Other Items

See “Capital Management and Regulatory Capital” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for a detailed description of the firm’s equity capital, and further information about the firm’s capital planning and stress testing process, including the Comprehensive Capital Analysis and Review, the Dodd-Frank Act Stress Tests, the internally designed stress tests, the internal capital adequacy assessment, and the attribution of capital and contingency capital plan.

See “Risk Management – Overview and Structure of Risk Management” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for further information about the firm’s risk management framework, including Board governance, processes and committee structure.

Measures of exposures and other metrics disclosed in this report and the FFIEC 101 Report may not be based on U.S. GAAP, may not be directly comparable to measures reported in the 2022 Form 10-K and may not all be comparable to similar measures used by other companies. These disclosures are not required to be, and have not been, audited by the firm’s independent auditors. The firm’s historical filings with the SEC and previous Pillar 3 and Regulatory Capital Disclosure documents are located at www.goldmansachs.com/investor-relations.

Regulatory Capital

The table below presents the risk-based capital and leverage requirements as of both December 2022 and December 2021 in accordance with the Advanced Capital Rules.

Table 1: Risk-Based Capital and Leverage Requirements

	Requirements
Risk-based capital requirements	
CET1 capital ratio	9.5%
Tier 1 capital ratio	11.0%
Total capital ratio	13.0%
Leverage requirements	
Tier 1 leverage ratio	4.0%
SLR	5.0%

In the table above:

- The CET1 capital ratio requirement includes a minimum of 4.5%, the Tier 1 capital ratio requirement includes a minimum of 6.0% and the Total capital ratio requirement includes a minimum of 8.0%. These requirements also include the capital conservation buffer requirements, consisting of a buffer of 2.5%, the G-SIB surcharge of 2.5% (Method 2) and the countercyclical capital buffer, which the FRB has set to zero percent.
- The G-SIB surcharge is updated annually based on financial data from the prior year and is generally applicable for the following year. The G-SIB surcharge is calculated using two methodologies, the higher of which is reflected in the firm's risk-based capital requirements. The first calculation (Method 1) is based on the Basel Committee's methodology which, among other factors, relies upon measures of the size, activity and complexity of each G-SIB. The second calculation (Method 2) uses similar inputs, but includes a measure of reliance on short-term wholesale funding.
- The Tier 1 leverage ratio requirement is a minimum of 4%. The SLR requirement of 5% includes a minimum of 3% and a 2% buffer applicable to G-SIBs.

See "Regulation" in Part I, Item 1 "Business" in the 2022 Form 10-K and "Regulatory and Other Matters" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K for further information about regulatory capital reforms that impacts the firm.

The table below presents information about risk-based capital and leverage ratios, calculated in accordance with the Advanced Capital Rules.

Table 2: Risk-Based Capital and Leverage Ratios

<i>\$ in millions</i>	As of December	
	2022	2021
CET1 capital	\$ 98,050	\$ 96,254
Tier 1 capital	\$ 108,552	\$ 106,766
Tier 2 capital	\$ 12,115	\$ 12,051
Total capital	\$ 120,667	\$ 118,817
RWAs	\$ 679,450	\$ 647,921
CET1 capital ratio	14.4%	14.9%
Tier 1 capital ratio	16.0%	16.5%
Total capital ratio	17.8%	18.3%
Average adjusted total assets	\$ 1,491,966	\$ 1,462,187
Tier 1 leverage ratio	7.3%	7.3%
Total leverage exposure	\$ 1,867,358	\$ 1,910,521
SLR	5.8%	5.6%

In the table above:

- Beginning in the fourth quarter of 2022, the firm updated the probability of default models used in the calculation of Advanced RWAs. The impact of this change was a decrease in the firm's Advanced CET1 capital ratio of approximately 0.7 percentage points.
- In the second half of 2022, based on regulatory feedback, the firm revised certain interpretations of the Capital Rules underlying the calculation of RWAs. As of December 2021, this change would have increased the firm's Advanced RWAs of \$648 billion by approximately \$6 billion, which would have reduced the firm's Advanced CET1 capital ratio of 14.9% by 0.2 percentage points, Advanced Tier 1 capital ratio of 16.5% by 0.2 percentage points and Advanced Total capital ratio of 18.3% by 0.1 percentage points.
- CET1 capital ratio is calculated as CET1 capital divided by RWAs, the Tier 1 capital ratio is calculated as Tier 1 capital divided by RWAs, and the Total capital ratio is calculated as Total capital divided by RWAs.
- Tier 1 leverage ratio is calculated as Tier 1 capital divided by average adjusted total assets for the quarter (which includes adjustments for goodwill and identifiable intangible assets, and certain investments in nonconsolidated financial institutions, as well as the impact of CECL transition).
- SLR is calculated as Tier 1 capital divided by total leverage exposure (which includes average adjusted total assets for the quarter, and monthly average of certain off-balance sheet exposures).

Capital Structure

The table below presents information about risk-based capital in accordance with the Advanced Capital Rules.

Table 3: Capital Structure

\$ in millions	As of December	
	2022	2021
Common stock	\$ 9	\$ 9
Share-based awards	5,696	4,211
Additional paid-in capital	59,050	56,396
Retained earnings	139,372	131,811
Accumulated other comprehensive loss	(3,010)	(2,068)
Stock held in treasury, at cost	(94,631)	(91,136)
Common shareholders' equity	106,486	99,223
Impact of CECL transition	829	1,105
Deduction for goodwill	(5,674)	(3,610)
Deduction for identifiable intangible assets	(1,770)	(401)
Other adjustments	(1,821)	(63)
CET1 capital	98,050	96,254
Preferred stock	10,703	10,703
Deduction for investments in covered funds	(199)	(189)
Other adjustments	(2)	(2)
Tier 1 capital	108,552	106,766
Qualifying subordinated debt	10,637	11,554
Junior subordinated debt	–	94
Other adjustments	1,478	403
Tier 2 capital	12,115	12,051
Total capital	\$ 120,667	\$ 118,817

In the table above:

- Beginning in January 2022, the firm started to phase in the estimated reduction to regulatory capital as a result of adopting the CECL model. Impact of CECL transition in the table above reflects the total amount of reduction of \$1.11 billion as of December 2021 to be phased in through January 2025 (at 25% per year), of which \$276 million was phased in on January 1, 2022. The total amount to be phased in includes the impact of adopting CECL as of January 1, 2020, as well as 25% of the increase in the allowance for credit losses from January 1, 2020 through December 31, 2021. Reflecting the full impact of CECL as of December 2022, the firm's Advanced ratios would have been 14.3% for CET1 capital, 15.8% for Tier 1 capital and 17.8% for Total capital. The firm's Standardized ratios would have been 14.9% for CET1 capital, 16.5% for Tier 1 capital and 19.1% for Total capital.
- Deduction for goodwill was net of deferred tax liabilities of \$700 million as of December 2022 and \$675 million as of December 2021.
- Deduction for identifiable intangible assets was net of deferred tax liabilities of \$239 million as of December 2022 and \$17 million as of December 2021.

- Deduction for investments in covered funds represents the firm's aggregate investments in applicable covered funds. As of December 2021, this deduction excluded investments that were subject to an extended conformance period. See Note 8 "Investments" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for further information about the Volcker Rule.
- Other adjustments within CET1 capital and Tier 1 capital primarily include credit valuation adjustments on derivative liabilities, the overfunded portion of the firm's defined benefit pension plan obligation net of associated deferred tax liabilities, disallowed deferred tax assets, debt valuation adjustments and other required credit risk-based deductions. Other adjustments within Tier 2 capital include eligible credit reserves.
- Qualifying subordinated debt is subordinated debt issued by Group Inc. with an original maturity of five years or greater. The outstanding amount of subordinated debt qualifying for Tier 2 capital is reduced upon reaching a remaining maturity of five years.

- Junior subordinated debt is debt issued to a Trust and was fully phased out of regulatory capital on January 1, 2022. As of December 2021, 10% of this debt was included in Tier 2 capital and 90% was phased out of regulatory capital. Junior subordinated debt is reduced by the amount of Trust Preferred securities purchased by the firm.

See Note 14 "Unsecured Borrowings" and Note 19 "Shareholders' Equity" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for further information about the terms and conditions of the common stock, perpetual non-cumulative preferred stock, junior subordinated debt issued to trusts and qualifying subordinated debt.

Pillar 3 Disclosures

See “Capital Management and Regulatory Capital” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K, and the following footnotes to the consolidated financial statements in Part II, Item 8 “Financial Statements and Supplementary Data” in the 2022 Form 10-K for further information about the firm’s capital:

- Note 12 “Other Assets” for information about the firm’s goodwill and identifiable intangible assets;
- Note 14 “Unsecured Borrowings” for information about the firm’s qualifying subordinated debt, junior subordinated debt and Trust Preferred securities; and
- Note 19 “Shareholders’ Equity” for information about common equity, preferred equity and accumulated other comprehensive income/(loss).

Total Loss-Absorbing Capacity (TLAC)

The firm is also subject to the FRB’s TLAC and related requirements. Failure to comply with the TLAC and related requirements would result in restrictions being imposed by the FRB and could limit the firm’s ability to repurchase shares, pay dividends and make certain discretionary compensation payments.

See “Capital Management and Regulatory Capital” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for further information about TLAC and related requirements.

Risk-Weighted Assets

The table below presents information about RWAs calculated in accordance with the Advanced Capital Rules.

Table 4: RWAs by Exposure Category

<i>\$ in millions</i>	As of December		
	2022	2021	
Credit RWAs			
Wholesale exposures	\$ 251,458	\$ 243,982	Credit Risk
Retail exposures	46,633	32,943	Credit Risk
Cleared exposures	4,992	4,775	Credit Risk
Other assets	42,465	39,476	Credit Risk
Equity exposures	31,557	43,002	Equity Exposures in the Banking Book
Securitization exposures	13,305	12,643	Securitized in the Banking Book
Credit RWAs subject to the 6% add-on	390,410	376,821	
6% add-on	23,424	22,609	
Credit valuation adjustment	47,479	39,069	Credit Risk
Total Credit RWAs	461,313	438,499	
Market RWAs			
Regulatory VaR	18,981	13,510	Market Risk
Stressed VaR	37,833	38,922	Market Risk
Incremental risk	6,470	6,867	Market Risk
Comprehensive risk	3,641	2,521	Market Risk
Specific risk	16,349	14,689	Market Risk
Total Market RWAs	83,274	76,509	
Total Operational RWAs	134,863	132,913	Operational Risk
Total RWAs	\$ 679,450	\$ 647,921	

Further information about each of the material components in the table above, including a description of the methodologies used, can be found in the remainder of this document, under the section references indicated above.

Total Credit RWAs as of December 2022 increased by \$22.81 billion compared with December 2021, primarily reflecting an increase in commitments, guarantees and loans, other credit RWAs and securities financing transactions (principally due to updates to the probability of default models in the fourth quarter of 2022). These increases were partially offset by a decrease in equity investments (principally due to reduced exposures as a result of sales and unrealized losses). Total Market RWAs as of December 2022 increased by \$6.77 billion compared with December 2021, primarily reflecting an increase in regulatory VaR (principally due to higher levels of market volatility). Total Operational RWAs as of December 2022 increased by \$1.95 billion compared with December 2021, primarily associated with litigation and regulatory proceedings.

Credit Risk

Overview

Credit risk represents the potential for loss due to the default or deterioration in credit quality of a counterparty (e.g., an OTC derivatives counterparty or a borrower) or an issuer of securities or other instruments the firm holds. The firm's exposure to credit risk comes mostly from client transactions in OTC derivatives and loans and lending commitments. Credit risk also comes from cash placed with banks, securities financing transactions (i.e., resale and repurchase agreements and securities borrowing and lending activities) and customer and other receivables.

Credit Risk, which is independent of the firm's revenue-producing units and reports to the chief risk officer, has primary responsibility for assessing, monitoring and managing credit risk through firmwide oversight across the firm's global businesses. In addition, the firm holds other positions that give rise to credit risk (e.g., bonds and secondary bank loans). These credit risks are captured as a component of market risk measures, which are monitored and managed by Market Risk. The firm also enters into derivatives to manage market risk exposures. Such derivatives also give rise to credit risk, which is monitored and managed by Credit Risk.

Credit Risk Management Process

The firm's process for managing credit risk includes the critical components of the risk management framework described in "Risk Management – Overview and Structure of Risk Management" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K, as well as the following:

- Monitoring compliance with established credit risk limits and reporting the firm's credit exposures and credit concentrations;
- Establishing or approving underwriting standards;
- Assessing the likelihood that a counterparty will default on its payment obligations;
- Measuring the firm's current and potential credit exposure and losses resulting from a counterparty default;
- Using credit risk mitigants, including collateral and hedging; and
- Maximizing recovery through active workout and restructuring of claims.

The firm also performs credit analyses, which incorporate initial and ongoing evaluations of the capacity and willingness of a counterparty to meet its financial obligations. For substantially all of the firm's credit exposures, the core of the process is an annual counterparty credit evaluation or more frequently if deemed necessary as a result of events or changes in circumstances. The firm determines an internal credit rating for the counterparty by considering the results of the credit evaluations and assumptions with respect to the nature of and outlook for the counterparty's industry and the economic environment. The internal credit rating does not take into consideration collateral received or other credit support arrangements. Senior personnel, with expertise in specific industries, inspect and approve credit reviews and internal credit ratings.

The firm's risk assessment process may also include, where applicable, reviewing certain key metrics, including, but not limited to, delinquency status, collateral value, Fair Isaac Corporation credit scores and other risk factors.

The firm's credit risk management systems capture credit exposure to individual counterparties and on an aggregate basis to counterparties and their subsidiaries. These systems also provide management with comprehensive information about the firm's aggregate credit risk by product, internal credit rating, industry, country and region.

Risk Measures

The firm measures credit risk based on the potential loss in the event of non-payment by a counterparty using current and potential exposure. For derivatives and securities financing transactions, current exposure represents the amount presently owed to the firm after taking into account applicable netting and collateral arrangements, while potential exposure represents the estimate of the future exposure that could arise over the life of a transaction based on market movements within a specified confidence level. Potential exposure also takes into account netting and collateral arrangements. For loans and lending commitments, the primary measure is a function of the notional amount of the position.

Pillar 3 Disclosures**Limits**

The firm uses credit risk limits at various levels, as well as underwriting standards to manage the size and nature of its credit exposures. Limits for industries and countries are based on the firm's risk appetite and are designed to allow for regular monitoring, review, escalation and management of credit risk concentrations. See "Risk Management – Overview and Structure of Risk Management" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K for information about the firm's limit approval process.

Credit Risk is responsible for monitoring these limits, and identifying and escalating to senior management and/or the appropriate risk committee, on a timely basis, instances where limits have been exceeded.

Credit Exposures

See Note 7 "Derivatives and Hedging Activities" and Note 11 "Collateralized Agreements and Financings" in Part II, Item 8 "Financial Statements and Supplementary Data" and "Risk Management – Credit Risk Management" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K for information about the firm's credit exposures, including the gross fair value, netting benefits and current exposure of its derivative exposures and securities financing transactions.

See "Risk Management – Credit Risk Management" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K for information about the firm's credit exposures to counterparties that defaulted.

Allowance for Credit Losses

See Note 9 "Loans" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for information about the firm's past due loans, loans on nonaccrual status, and allowance for credit losses.

Credit RWAs

Credit RWAs are calculated based on measures of credit exposure, which are then risk weighted. Wholesale exposures generally include credit exposures to corporates, sovereigns or government entities (other than securitization, retail or equity exposures). Retail exposures are composed of residential mortgage exposures, qualifying revolving exposures, or other retail exposures, that are managed as part of a segment with homogeneous risk characteristics, not on an individual exposure basis. Certain loans to individuals, including some loans backed by residential real estate, are categorized as wholesale, rather than retail, exposures under the Capital Framework, as the associated credit risk is assessed on an individual basis and not as part of a portfolio of exposures. The firm computes risk weights for certain exposures in accordance with the Advanced Internal Ratings-Based (AIRB) approach, which utilizes internal assessments of each counterparty's creditworthiness. In addition, the firm utilizes internal models to measure exposures for derivatives and securities financing products using the Internal Models Methodology (IMM).

Exposure at Default (EAD). For on-balance sheet wholesale exposures, such as receivables and cash, the EAD is generally based on the carrying value. For the calculation of EAD for off-balance sheet exposures, including commitments and guarantees, a credit equivalent exposure amount is calculated based on the notional amount of each transaction multiplied by a credit conversion factor designed to estimate the net additions to funded exposures that would be likely to occur over a one-year horizon, assuming the obligor were to default. Historical studies and empirical data are generally used to estimate the credit conversion factor.

For on-balance sheet retail exposures, the EAD is generally based on the carrying value. For off-balance sheet retail exposures, EAD is the firm's best estimate of net additions to funded exposures that would be likely to occur over a one-year horizon assuming the retail exposures in the segment were to default.

Pillar 3 Disclosures

For substantially all of the counterparty credit risk arising from OTC derivatives, exchange-traded derivatives and securities financing transactions, the firm uses internal models to calculate the distribution of exposure upon which the EAD calculation is based, in accordance with the IMM. The models estimate Expected Exposures (EE) at various points in the future using risk factor simulations. As defined in the Capital Framework, EE is the expected value of the probability distribution of non-negative credit risk exposures to a counterparty at any specified future date before the maturity date of the longest term transaction in a netting set. The model parameters are derived from historical and implied market data using the most recent three-year period, as well as a stressed three-year period. The models also estimate the Effective Expected Positive Exposure (EEPE) over the first year of the portfolio, which is the time-weighted average of non-declining positive credit exposure over the EE simulation. In accordance with the Advanced Capital Rules, the firm calculates two EEPEs: one based on stressed conditions and one based on unstressed conditions. For the stressed EEPE calculation, the model is re-calibrated using historical market parameters from a period of stress as identified by elevated credit spreads for the firm's counterparties. Both stressed and unstressed EAD are calculated by multiplying the EEPE by a standard regulatory factor of 1.4. The firm's RWAs calculated in accordance with the IMM are the greater of the RWAs based on the stressed or unstressed EEPE.

The firm's implementation of the IMM incorporates the impact of netting and collateral into calculations of exposure. The EAD detailed in Table 5 below represents the exposures used in computing capital requirements and is not directly comparable to amounts presented in the firm's consolidated balance sheets in the 2022 Form 10-K, due to differences in measurement methodology, counterparty netting and collateral offsets used.

AIRB Approach. RWAs are calculated by multiplying EAD by the counterparty's risk weight. In accordance with the AIRB approach, risk weights are a function of the counterparty's probability of default (PD), loss given default (LGD) and the effective maturity of the trade or portfolio of trades.

Wholesale Credit Risk Parameters

Wholesale exposures are internally risk rated and assigned PDs and LGDs.

- PD is an estimate of the probability that an obligor will default over a one-year horizon. For the majority of the firm's wholesale exposure, the PD is assigned using an approach where quantitative factors are combined with a qualitative assessment to determine internal credit rating grades. For each internal credit rating grade, over 5 years of historical empirical data is used to calculate a long run average annual PD which is assigned to each counterparty with that credit rating grade.

While the firm's default experience is incorporated into the determination of PD, its internal credit rating grades each have external public rating agency equivalents. The scale that the firm employs for internal credit ratings corresponds to those used by the major rating agencies and its internal credit ratings, while arrived at independently of public ratings, are assigned using definitions of each internal credit rating grade that are consistent with the definitions used by the major rating agencies for their equivalent credit rating grades. As a result, the firm is able to map default data published by the major rating agencies for obligors with public ratings to counterparties with equivalent internal credit ratings for use in quantification and validation of risk parameters.

- LGD is an estimate of the economic loss rate if a default occurs during economic downturn conditions. For wholesale exposures, the LGD is determined using recognized vendor models, but exposure-specific estimates of LGD are employed where the recovery prospects of an exposure are more accurately captured by an analysis incorporating information about the specific collateral, structure or counterparty.
- The definition of effective maturity depends on the nature of the exposure. For OTC derivatives, effective maturity is an average time measure weighted by credit exposure (based on EE and EEPE). For securities financing transactions, effective maturity represents the notional weighted average number of days to maturity. For other products, the effective maturity is based on the contractual maturity. Effective maturity is floored at one year and capped at five years except where the Advanced Capital Rules allow a maturity of less than one year to be used as long as certain criteria are met.

The table below presents a distribution of total EAD, exposure-weighted average LGD, PD and risk weight, and RWAs by PD band range for wholesale exposures (excluding cleared transactions). In addition, the table includes the notional amount of undrawn commitments and guarantees that are included in the total EAD.

Table 5: Credit Risk Wholesale Exposures by PD Band

As of December 2022							
\$ in millions	Total EAD	Exposure-Weighted Average			RWAs	Undrawn	Undrawn
		LGD	PD	Risk Weight		Commitments and Guarantees	Commitments and Guarantees EAD
PD Band Range							
0 to <0.05%	\$ 448,282	18.74%	0.02%	2.96%	\$ 13,252	\$ 19,251	\$ 14,726
0.05% to <0.25%	198,576	39.92%	0.13%	26.28%	52,180	76,297	53,804
0.25% to <0.75%	14,338	34.56%	0.59%	57.92%	8,304	7,006	3,269
0.75% to <5.0%	72,193	34.40%	1.84%	85.57%	61,779	26,402	12,812
5.0% to <10.0%	42,378	34.85%	6.89%	138.71%	58,783	19,628	9,377
10.0% to <100%	23,927	43.69%	14.69%	221.33%	52,957	7,166	3,906
100% (default)	4,203	32.01%	100.00%	100.00%	4,203	448	44
Total	\$ 803,897				\$ 251,458	\$ 156,198	\$ 97,938

In the table above:

- Total EAD included \$149.55 billion of counterparty credit risk EAD.
- Collateral is generally factored into the total EAD for OTC derivatives and securities financing transactions using the IMM.
- Undrawn commitments and guarantees excluded \$7.81 billion that are treated for regulatory capital purposes as securitizations. See “Securitizations in the Banking Book” for further information.

Retail Credit Risk Parameters

For retail exposures, statistical techniques are used to devise risk segmentation that results in homogeneous risk segments that are heterogeneous from each other. Segmentation uses borrower-related and exposure-related characteristics that reliably and consistently, over time, differentiate a segment’s risk from that of other segments. Risk drivers considered for segmentation are generally consistent with the predominant risk characteristics used for internal credit risk measurement and management.

- Retail PD is the firm’s empirically based best estimate of the long-run average one-year default rate for the exposures in the segment, capturing the average default experience for exposures in the segment over a mix of economic conditions, including economic downturn conditions.
- Retail LGD is the firm’s empirically based best estimate of the economic loss or long-run default-weighted average economic loss, per dollar of EAD, the firm would expect to incur if the exposures in the segment were to default within a one-year horizon over a mix of economic conditions, including economic downturn conditions.

The table below presents a distribution of total EAD, exposure-weighted average LGD, PD and risk weight, and RWAs by PD band range for retail exposures. In addition, the table includes the notional amount of undrawn commitments and guarantees that are included in the total EAD.

Table 6: Credit Risk Retail Exposures by PD Band

As of December 2022							
\$ in millions	Total EAD	Exposure-Weighted Average			RWAs	Undrawn	Undrawn
		LGD	PD	Risk Weight		Commitments and Guarantees	Commitments and Guarantees EAD
PD Band Range							
0 to <0.05%	\$ 3,438	21.13%	0.04%	2.65%	\$ 91	\$ 3,778	\$ 612
0.05% to <0.25%	10,672	53.72%	0.14%	8.18%	873	13,812	4,374
0.25% to <0.75%	19,895	81.60%	0.47%	22.11%	4,400	37,352	12,622
0.75% to <5.0%	24,498	91.06%	2.07%	80.19%	19,643	17,489	7,604
5.0% to <10.0%	4,804	96.64%	6.97%	146.65%	7,045	862	902
10.0% to <100%	5,980	90.36%	31.07%	206.20%	12,331	980	1,327
100% (default)	2,250	29.68%	100.00%	100.00%	2,250	89	104
Total	\$ 71,537				\$ 46,633	\$ 74,362	\$ 27,545

In the table above:

- Retail exposures include purchased performing and distressed loans backed by residential real estate and consumer loans.
- Total EAD included residential mortgage exposures of \$16.00 billion, qualifying revolving exposures of \$37.03 billion and other retail exposures of \$18.52 billion.
- The majority of undrawn commitments are qualifying revolving exposures, which are unconditionally cancelable.

Governance and Validation of Risk Parameters

Approaches and methodologies for quantifying PD, LGD, and EAD are monitored and managed by Credit Risk. Models used for regulatory capital are independently reviewed, validated and approved by Model Risk. See “Model Risk” for further information.

To assess the performance of the PD parameters used, the firm performs a benchmarking exercise which includes comparisons of realized annual default rates to the expected annual default rates for each credit rating band and comparisons of the internal realized long-term average default rates to the empirical long-term average default rates assigned to each credit rating band. For the year ended December 2022, as well as in previous annual periods, the PDs used for regulatory capital calculations were, on average, higher (i.e., more conservative) than the firm’s actual internal realized default rate.

To assess the performance of LGD parameters used, the firm compares actual recovery rates following counterparty defaults to the recovery rates based on LGD parameters assigned to the corresponding exposures prior to default. While the actual realized recovery on each defaulted exposure varies due to transaction and other situation-specific factors, on average, recovery rates remain higher than those implied by the LGD parameters used in the firm’s regulatory capital calculations.

The performance of each IMM model used to quantify EAD is assessed quarterly via backtesting procedures, performed by comparing the predicted and realized exposure of a set of representative trades and portfolios at certain horizons. The firm’s models are monitored and enhanced in response to backtesting.

Credit Risk Mitigation

To reduce the firm’s credit exposures on derivatives and securities financing transactions, it may enter into master netting agreements or similar arrangements (collectively, netting agreements) with counterparties that permits it to offset receivables and payables with such counterparties. A netting agreement is a contract with a counterparty that permits net settlement of multiple transactions with that counterparty, including upon the exercise of termination rights by a non-defaulting party. Upon exercise of such termination rights, all transactions governed by the netting agreement are terminated and a net settlement amount is calculated.

Pillar 3 Disclosures

The firm may also reduce credit risk with counterparties by entering into agreements that enables it to receive and post cash and securities collateral with respect to derivatives and securities financing transactions, subject to the terms of the related credit support agreements or similar arrangements (collectively, credit support agreements). An enforceable credit support agreement grants the non-defaulting party exercising termination rights the right to liquidate the collateral and apply the proceeds to any amounts owed. In order to assess enforceability of the firm's right to setoff under netting and credit support agreements, it evaluates various factors, including applicable bankruptcy laws, local statutes and regulatory provisions in the jurisdiction of the parties to the agreement. Securities collateral obtained primarily includes U.S. and non-U.S. government and agency obligations.

The firm's collateral is managed by certain functions within the firm which review exposure calculations, make margin calls with relevant counterparties, and ensure subsequent settlement of collateral movements. The firm monitors the fair value of the collateral to ensure that its credit exposures are appropriately collateralized.

See Note 7 "Derivatives and Hedging Activities" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for further information about the firm's derivatives (including collateral and the impact of the amount of collateral the firm would have to provide in the event of a ratings downgrade). See Note 11 "Collateralized Agreements and Financings" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for further information about collateralized agreements and financings.

For loans and lending commitments, depending on the credit quality of the borrower and other characteristics of the transaction, the firm employs a variety of potential risk mitigants. Risk mitigants include collateral provisions, guarantees, covenants, structural seniority of the bank loan claims and, for certain lending commitments, provisions in the legal documentation that allows the firm to adjust loan amounts, pricing, structure and other terms as market conditions change. The type and structure of risk mitigants employed can significantly influence the degree of credit risk involved in a loan or lending commitment.

When the firm does not have sufficient visibility into a counterparty's financial strength or when it believes a counterparty requires support from its parent, it may obtain third-party guarantees of the counterparty's obligations. The firm may also mitigate credit risk using credit derivatives or participation agreements.

Credit Derivatives

The firm enters into credit derivative transactions primarily to facilitate client activity and to manage the credit risk associated with market-making, including to hedge counterparty exposures arising from OTC derivatives (intermediation activities).

The firm also uses credit derivatives to hedge counterparty exposure associated with investing and financing activities. Some of these hedges qualify as credit risk mitigants for regulatory capital purposes. For these transactions, the substitution approach is applied, where the PD and/or LGD associated with the credit derivative counterparty replaces the PD and/or LGD of the loan obligors for capital calculations. Where the aggregate notional of credit derivatives hedging exposure to a loan obligor is less than the notional loan exposure, the substitution approach is only employed for the percentage of loan exposure covered by eligible credit derivatives. As of December 2022, the firm's purchased credit default swaps that were used to hedge counterparty exposure associated with investing and financing activities had a notional amount of \$27.08 billion, of which \$13.26 billion were deemed to be eligible hedges for regulatory capital purposes.

See Note 7 "Derivatives and Hedging Activities" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for further information about the firm's credit derivative transactions.

See Note 26 "Credit Concentrations" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for information about credit risk concentrations.

Wrong-Way Risk

The firm seeks to minimize risk where there is a significant positive correlation between the PD of a counterparty and its exposure to that counterparty (net of the market value of any collateral it receives), which is known as wrong-way risk. Wrong-way risk is commonly categorized into two types: specific wrong-way risk and general wrong-way risk. The firm categorizes exposure as specific wrong-way risk when the counterparty and the issuer of the reference asset of the transaction are the same entity or are affiliates, or if the collateral supporting a transaction is issued by the counterparty or its affiliates. General wrong-way risk arises when there is a significant positive correlation between the PD of a counterparty and general market risk factors affecting the exposure to that counterparty. The firm has procedures in place to actively identify, monitor and control specific and general wrong-way risk, beginning at the inception of a transaction and continuing through its life, including assessing the level of risk through stress tests. The firm ensures that material wrong-way risk is mitigated using collateral agreements or increases to initial margin, where appropriate.

Credit Valuation Adjustment (CVA) RWAs

RWAs for CVA address the risk of losses related to changes in counterparty credit risk arising from OTC derivatives. The firm calculates RWAs for CVA primarily using the Advanced CVA approach set out in the Capital Framework, which permits the use of regulator approved VaR models. Consistent with the firm's regulatory VaR calculation, the CVA RWAs are calculated at a 99% confidence level over a 10-day time horizon. See "Market Risk" for further information. The CVA RWAs also include a stressed CVA component, which is also calculated at a 99% confidence level over a 10-day horizon using both a Stressed VaR period and stressed EEs. The CVA VaR model estimates the impact on the firm's credit valuation adjustments of changes to its counterparties' credit spreads. It reflects eligible CVA hedges (as defined in the Capital Framework), but it excludes those hedges that, although used for risk-management purposes, are ineligible for inclusion in the regulatory CVA VaR model. Examples of such hedges are interest rate hedges, or those that do not reference the specific exposures they are intended to mitigate, but are nevertheless highly correlated to the underlying credit risk.

Other Credit RWAs

Credit RWAs (as summarized in Table 4 above) also include the following components:

Cleared Transactions. RWAs for cleared transactions and default fund contributions (defined as payments made by clearing members to central clearing agencies pursuant to mutualized loss arrangements) are calculated based on specific rules within the Capital Framework. A majority of the firm's exposures on centrally cleared transactions are to counterparties that are considered to be Qualifying Central Counterparties in accordance with the Capital Framework. Such exposures arise from OTC derivatives, exchange-traded derivatives, and securities financing transactions, which are required to be risk weighted at either 2% or 4% based on the specified criteria.

Other Assets. Other assets primarily include property, leasehold improvements and equipment, deferred tax assets, and assets for which there is no defined capital methodology or that are not material. RWAs for other assets are generally based on the carrying value plus a percentage of the notional amount of off-balance sheet exposures, and are typically risk weighted at 100%.

Equity Exposures in the Banking Book**Overview**

The firm makes investments, both directly and indirectly through funds that it manages, in public and private equity securities, as well as in debt securities and loans and real estate entities. The firm also enters into commitments to make such investments. These investments are typically longer-term in nature and are primarily held for capital appreciation purposes. Equity investments that are not consolidated are classified for regulatory capital purposes as banking book equity exposures. See the following sections in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K:

- Note 8 "Investments" for further information about the firm's equity investments;
- Note 18 "Commitments, Contingencies and Guarantees" for information about equity investment commitments; and
- Note 22 "Transactions with Affiliated Funds" for further information about transactions with affiliated funds.

Pillar 3 Disclosures**Risk Management**

The firm's equity investments and investment commitments are subject to comprehensive risk management processes through which it assesses investment opportunities, and monitors, evaluates and manages the risks associated with such investments.

Risk management governance starts with the Board, which both directly and through its committees oversees the firm's risk management policies and practices.

Prior to making an equity investment, or entering into an investment commitment, opportunities are subject to rigorous due diligence review by both investment professionals and control side functions and approval by the relevant divisional investment committee and, where appropriate, firmwide transactional committees, such as the Firmwide Reputational Risk Committee. The committees consider, among other matters, the risks and rewards of the opportunity, as well as factors, such as balance sheet usage and risk measures such as stress tests.

On an ongoing basis, the firm's equity exposures are reviewed by senior management and the Firmwide Risk Council. Other critical components of the firm's risk management processes and procedures include setting limits (such as balance sheet limits) and the firm's discipline of marking substantially all of its equity investments to current market levels, verified by the firm's independent risk oversight and control functions.

The firm's equity exposures are included in the scope of its stress tests, which are conducted on a regular basis as part of the firm's routine risk management process and on an ad hoc basis in response to market events or concerns. The firm uses stress tests to examine the risks of specific equity investments, as well as the potential impact of significant risk exposures across the firm. The firm uses a variety of scenarios to calculate the potential loss from a wide range of market moves on its equity investments.

Valuation and Accounting Policies

Substantially all of the firm's equity investments are held at fair value. See the following sections in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for further information about the firm's accounting and valuation policies applicable to equity investments:

- Note 3 "Significant Accounting Policies" for a description of the firm's policies on consolidation accounting, equity-method investments and investment funds;
- Note 4 "Fair Value Measurements" for a description of the valuation techniques and significant inputs used to determine fair values; and
- Note 8 "Investments" for a description of the firm's policies for recognizing fair value gains and losses through earnings.

Regulatory Capital Measurement

The firm's equity exposures include investments in funds that are required to be treated as financial institutions in accordance with the Capital Framework for the purposes of calculating the deduction from capital for investments in the capital of nonconsolidated financial institutions. If an equity investment in a nonconsolidated financial institution is 10% or more of that institution's common equity (or equivalent), then it is regarded as significant. The firm is required to deduct from its CET1 capital any excess of the aggregate of its significant investments in the common stock of nonconsolidated financial institutions that exceeds 10% of its CET1 capital, subject to certain adjustments. The remainder of the aggregate of the firm's significant investments is risk weighted at 250%. All non-common significant investments must be deducted from Tier 1 or Tier 2 capital using the corresponding deduction approach.

The computation of RWAs for banking book equity investments that are not deducted from capital is based on the Full Look-Through Approach (FLTA), the Simple Modified Look-Through Approach (SMLTA), or the Simple Risk Weight Approach (SRWA). For equity exposures to investment funds, the firm uses either the FLTA or the SMLTA to calculate RWAs. Under the FLTA, RWAs are calculated by computing a risk weight on each of the underlying exposures held by the fund as if they were held directly by the firm, then multiplying that risk weight by the firm's proportional ownership share of the fund. Under the SMLTA, the firm determines an appropriate risk weight to assign to its entire exposure to the fund, which is based on the highest risk weight that applies to any exposure the fund is permitted to hold. An equity investment in an investment fund is considered applicable for treatment in accordance with the look-through approach if the investment fund has no material liabilities and the assets of the fund are substantially all financial assets.

Pillar 3 Disclosures

Direct equity investments and equity investments in leveraged investment funds are risk weighted in accordance with the SRWA in the table below.

Risk Weight	Investment Category
20%	An equity exposure to a Public Sector Entity (PSE), Federal Home Loan Bank (FHLB) or Farmer Mac
100%	Community development equity exposures
100%	Non-significant equity exposures to the extent that the aggregate adjusted carrying value of the exposures does not exceed 10% of Tier 1 capital plus Tier 2 capital
250%	Significant investments in the common stock of nonconsolidated financial institutions which are not deducted from capital
300%	A publicly traded equity exposure (other than an equity exposure that receives a 600% risk weight)
400%	A private equity exposure (other than an equity exposure that receives a 600% risk weight)
600%	An equity exposure to an investment firm that (i) would meet the definition of a traditional securitization but for the fact that the investment firm can exercise control over the size and composition of their assets, liabilities, and off-balance sheet exposures, and (ii) has greater than immaterial leverage

Risk weights are applied to the adjusted carrying value of the equity exposure. For on-balance sheet positions, the adjusted carrying value is generally based on the balance sheet carrying value. For the firm's unfunded equity investment commitments, the adjusted carrying value is a percentage of the notional amount, based on the estimated funding of the commitment during economic downturn conditions.

Although the SRWA assigns specific risk weights to different types of equity exposures presented above, the regulations allow for non-significant equity exposures to be risk weighted at 100% to the extent they do not exceed in the aggregate 10% of the firm's Tier 1 plus Tier 2 capital, with the remaining portion then risk weighted as appropriate in accordance with the SRWA. Generally, those equity exposures that would attract the lowest risk weights under SRWA are required to be treated as non-significant equity exposures, before inclusion of any equity exposures that would otherwise attract higher risk weights under SRWA.

The table below presents the adjusted carrying values and RWAs for the firm's equity exposures in the banking book.

Table 7: Equity Exposures in the Banking Book

	As of December 2022		
	Adjusted Carrying Value	Risk Weight (%)	RWAs
<i>\$ in millions</i>			
SRWA			
Equity exposures to a PSE, FHLB or Farmer Mac	\$ 33	20%	\$ 7
Community development equity exposures	3,827	100%	3,827
Non-significant equity exposures	11,128	100%	11,128
Significant investments in the common stock of nonconsolidated financial institutions	3,859	250%	9,648
Publicly traded equity exposures	5	300%	15
Private equity exposures	2,115	400%	2,115
Equity exposures in leveraged investment funds	572	600%	3,432
Total SRWA	21,539		30,172
Equity Exposures to Investment Funds			
FLTA	345		328
SMLTA	130		1,057
Total Equity Exposures to Investment Funds	475		1,385
Total Equity Exposures	\$ 22,014		\$ 31,557

In the table above:

- The firm's publicly traded and private equity exposures are risk weighted as non-significant equity exposures or may be inclusive of hedge pairs attracting a risk weight that differs from its investment category.
- Adjusted carrying value consisted of \$2.20 billion of publicly traded and \$19.82 billion of private equity exposures, of which \$2.39 billion is unfunded commitment exposure.

Securitizations in the Banking Book

Overview

The Capital Framework defines certain activities as securitization transactions which attract capital requirements in accordance with the securitization section of the Capital Framework. A portion of the firm's positions that meet the regulatory definition of a securitization are in its trading book and capital requirements for those positions are calculated in accordance with the market risk capital rules. See "Market Risk - Specific Risk - Securitization Positions" for further information. However, the firm also has certain banking book positions that meet the regulatory definition of a securitization.

In accordance with the Capital Framework, the regulatory definition of a securitization includes the following criteria:

- All or a portion of the credit risk of one or more underlying exposures is transferred to one or more third parties;
- The credit risk associated with the underlying exposures has been separated into at least two tranches reflecting different levels of seniority;
- Performance of the securitization exposures depends upon the performance of the underlying exposures; and
- All or substantially all of the underlying exposures are financial exposures.

The regulations also distinguish between traditional and synthetic securitizations, the primary difference being that a traditional securitization involves the transfer of assets from a bank's balance sheet into a securitization vehicle, whereas a synthetic securitization involves the transfer of credit risk through credit derivatives or guarantees.

There are also specific rules for resecuritization exposures (a resecuritization exposure is one which involves the securitization of assets, one or more of which has already been securitized). As of December 2022, the firm did not have any material banking book securitization exposures that met the definition of a resecuritization.

The firm has described below the banking book activities that meet the regulatory definition of a securitization. It is important to note that the scope of banking book securitizations for regulatory purposes is not comparable to the securitization activity reported in Note 16 "Securitization Activities" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K.

Warehouse Financing and Lending. The firm provides financing to clients who warehouse financial assets. These arrangements are secured by the warehoused assets. Some of these transactions meet the definition of a securitization exposure in accordance with the Capital Framework. The firm also provides financing to non-operating companies on an over-collateralized basis.

OTC Derivatives facing Securitization Special Purpose Entities (SSPEs). The firm has OTC derivatives (primarily credit derivatives) with counterparties that meet the definition of an SSPE. An SSPE is an entity organized for the specific purpose of holding the assets underlying a securitization, whose activities are limited to holding such assets, and whose structure is intended to isolate the underlying assets from the credit risk of the seller who originally sold them to the SSPE. An OTC derivative with an SSPE counterparty attracts counterparty credit risk capital requirements in accordance with the securitization section of the Capital Framework. All of the firm's derivatives that fall into this category are considered to be covered positions in accordance with the Capital Framework, and as such they are also subject to market risk regulatory capital requirements. See "Market Risk" for further information.

Other. The firm has certain other banking book securitization activities, such as holding securities issued by securitization vehicles.

Risk Management

By engaging in the banking book securitization activities noted above, the firm is primarily exposed to credit risk and to the performance of the underlying assets. The firm mitigates the credit risk arising on its banking book securitization activities primarily through the purchase of credit protection and through obtaining collateral, predominantly in the form of cash, securities or loans. These positions are incorporated into the firm's overall risk management of financial instruments.

Accounting and Valuation Policies

See Note 3 "Significant Accounting Policies" and related footnotes in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K for information about accounting and valuation policies applicable to banking book securitization activities.

Pillar 3 Disclosures**Securitization Exposure Amount**

The table below presents the definition of exposure amount that is used for regulatory purposes for banking book securitizations.

Securitization Exposure Amount by Product - Banking Book

On-Balance Sheet Loans and Securities: carrying value (either fair value or cost)

Off-Balance Sheet Unfunded commitments: the notional amount for unfunded commitments adjusted by the appropriate credit conversion factor

Credit derivatives: the notional amount for credit derivatives adjusted for applicable collateral after applying the appropriate haircuts

Other derivatives: model-based EEPE for OTC derivative contracts (except for credit derivatives)

Calculation of RWAs

RWAs for banking book securitization exposures (including counterparty credit risk exposures that arise from trading book derivative positions) are calculated through application of a hierarchy of approaches described below.

Deduction. The firm is required to deduct from CET1 capital any after-tax gain on sale resulting from the sale of loans for the purpose of a traditional securitization, unless the banking organization's equity capital has increased as a consequence of having received cash in connection with the securitization. As of December 2022, the firm did not have any material deductions of this nature.

Supervisory Formula Approach (SFA). If the firm is in a position to obtain or calculate, on an on-going basis (using data no more than 91 days old), all of the parameters needed to perform the SFA calculation, then it must use this methodology to calculate the capital requirements for a securitization position. In accordance with the SFA, RWAs are based on the capital requirements that would apply to the underlying assets if they were held directly on the firm's balance sheet, which is then adjusted to take account of the degree of subordination (i.e., loss absorbance by junior tranches) of a given tranche. The capital requirements that would apply in accordance with the Advanced Capital Rules to the underlying assets must be calculated separately for each asset, unless the underlying assets are a homogenous pool of retail exposures, in which case the calculation can be done for the overall pool.

Simplified Supervisory Formula Approach (SSFA).

The SSFA is allowed to be used to calculate banking book securitization RWAs only if the information needed to perform the SFA is not available, and only if the data used in the calculation is no more than 91 calendar days old.

Consistent with the SFA, the SSFA is based on the capital requirements that would apply to the underlying pool of assets of a securitization if they were held directly on the balance sheet. These securitizations are then adjusted to take account of the degree of subordination of a given tranche, and the level of delinquent exposures in the pool. A key difference, however, is that the capital requirements applicable to the assets in the securitization pool are calculated using the Standardized Capital Rules, rather than the Advanced Capital Rules.

1,250% Risk Weight. If the securitization is neither deducted from regulatory capital, nor qualifies for either SFA or SSFA, a 1,250% risk weight is applied.

An exception to the hierarchy of approaches described above is for securitizations that are non-credit OTC derivatives that have a first priority claim on the cash flows from the underlying exposures. Subject to supervisory approval, the RWAs for such securitizations may be equal to the exposure amount.

Pillar 3 Disclosures

The table below presents the exposure amount and related RWAs of the firm's banking book securitizations, including on-balance sheet (retained or purchased) and off-balance sheet exposures by underlying exposure type.

Exposure amounts below represent the associated EAD as calculated and defined by the Capital Framework, and are not comparable to securitization measures reported in Note 16 "Securitization Activities" in Part II, Item 8 "Financial Statements and Supplementary Data" in the 2022 Form 10-K.

OTC derivatives facing SSPEs below represent counterparty credit risk charges on trading book OTC derivative transactions that face SSPEs. See "Market Risk – Specific Risk – Securitization Positions" for further information about the firm's trading book exposures.

Table 8: Securitization Exposures and Related RWAs by Exposure Type

	As of December 2022			
	EAD			RWAs
	On-balance sheet EAD	Off-balance sheet EAD	Total EAD	
Residential mortgages	\$ 7,026	\$ 475	\$ 7,501	\$ 4,679
Commercial mortgages	10,227	625	10,852	3,937
Corporates	8,343	1,952	10,295	2,233
Asset-backed and other	4,496	4,757	9,253	2,431
OTC derivatives facing SSPEs	0	20	20	25
Total	\$ 30,092	\$ 7,829	\$ 37,921	\$ 13,305

The table below presents the aggregate amount of the firm's banking book securitization exposures further categorized by risk-based capital approach and risk-weight bands.

Exposure amounts below represent the associated EAD, as calculated and defined by the Capital Framework.

Table 9: Securitization Exposures and Related RWAs by Regulatory Capital Approach

	As of December 2022							
	SFA		SSFA		1,250% risk weight		Total	
	EAD	RWAs	EAD	RWAs	EAD	RWAs	EAD	RWAs
0% - 25%	\$ —	\$ —	\$ 33,903	\$ 6,810	\$ —	\$ —	\$ 33,903	\$ 6,810
26% - 100%	—	—	1,792	1,173	—	—	1,792	1,173
101% - 250%	—	—	1,823	2,665	—	—	1,823	2,665
251% - 650%	—	—	191	1,083	—	—	191	1,083
651% - 1,250%	—	—	212	1,574	—	—	212	1,574
Total	\$ —	\$ —	\$ 37,921	\$ 13,305	\$ —	\$ —	\$ 37,921	\$ 13,305

Pillar 3 Disclosures

The firm accounts for a securitization as a sale when it has relinquished control over the transferred financial assets. Prior to securitization, the firm generally accounts for assets pending transfer at fair value and therefore does not typically recognize significant gains or losses upon the transfer of assets. As of December 2022, total assets held with the intent to securitize were \$9.99 billion.

The table below presents the principal amount of positions that the firm held in its banking book that have been securitized in the current year, whether or not it has retained a position.

The principal amount is presented for the purpose of providing information about the size of the firm's banking book securitization activities. This amount is not representative of the firm's risk of loss.

Table 10: Securitization Activity – Banking Book

<i>\$ in millions</i>	Year Ended December 2022
Residential mortgages	\$ 10,938
Commercial mortgages	7,776
Asset-backed and other	2,638
Total activity	\$ 21,352

Market Risk**Overview**

Market risk is the risk of an adverse impact to the firm's earnings due to changes in market conditions. Categories of market risk include the following:

- Interest rate risk: results from exposures to changes in the level, slope and curvature of yield curves, the volatilities of interest rates, prepayment speeds and credit spreads;
- Equity price risk: results from exposures to changes in prices and volatilities of individual equities, baskets of equities and equity indices;
- Currency rate risk: results from exposures to changes in spot prices, forward prices and volatilities of currency rates; and
- Commodity price risk: results from exposures to changes in spot prices, forward prices and volatilities of commodities, such as crude oil, petroleum products, natural gas, electricity, and precious and base metals.

Market Risk, which is independent of the firm's revenue-producing units and reports to the chief risk officer, has primary responsibility for assessing, monitoring and managing market risk through firmwide oversight across the firm's global businesses.

Managers in revenue-producing units, Treasury and Market Risk discuss market information, positions and estimated loss scenarios on an ongoing basis. Managers in revenue-producing units and Treasury are accountable for managing risk within prescribed limits. These managers have in-depth knowledge of their positions, markets and the instruments available to hedge their exposures.

Market Risk Management Process

The firm's process for managing market risk includes the critical components of the risk management framework described in "Risk Management – Overview and Structure of Risk Management" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K, as well as the following:

- Monitoring compliance with established market risk limits and reporting the firm's exposures;
- Diversifying exposures;
- Controlling position sizes; and
- Evaluating mitigants, such as economic hedges in related securities or derivatives

The firm produces risk measures and monitors them against established market risk limits. These measures reflect an extensive range of scenarios and the results are aggregated at product, business and firmwide levels. See "Risk Management – Market Risk Management" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K for further information about the firm's market risk measures, and risk limits.

Market RWAs

The firm's covered positions are subject to market risk capital requirements which are designed to cover the risk of loss in value of these positions due to changes in market conditions. These capital requirements are determined either by applying prescribed risk weighting factors, or they are based on internal models which are subject to various qualitative and quantitative parameters. The market risk section of the Capital Framework requires that a BHC obtain prior written agreement from its regulators before using any internal model to calculate its risk-based capital requirement for covered positions.

Pillar 3 Disclosures

RWAs for market risk under the market risk section of the Capital Framework are calculated using the following internal models: VaR, stressed VaR (SVaR), incremental risk and comprehensive risk. In addition, the specific risk measure is also used to calculate RWAs for market risk, under the standardized measurement method, for certain securitized and non-securitized covered positions by applying risk-weighting factors predetermined by regulators, to positions after applicable netting is performed. As defined in the Capital Framework, RWAs for market risk are the sum of each of these measures multiplied by 12.5. An overview of each of these measures is provided below.

Regulatory VaR. VaR is the potential loss in value of trading assets and liabilities, as well as certain investments, loans, and other financial assets and liabilities accounted for at fair value, due to adverse market movements over a defined time horizon with a specified confidence level. For both risk management purposes (positions subject to VaR limits) and regulatory capital calculations (for covered positions), the firm uses a single VaR model, which captures risks, including those related to interest rates, equity prices, currency rates and commodity prices. As such, VaR facilitates comparison across portfolios of different risk characteristics. VaR also captures the diversification of aggregated risk at the firmwide level.

VaR used for risk management purposes differs from VaR used for regulatory capital requirements (regulatory VaR) due to differences in time horizons, confidence levels and the scope of positions on which VaR is calculated. For risk management purposes, a 95% one-day VaR is used, whereas for regulatory capital requirements, a 99% 10-day VaR is used to determine Market RWAs and a 99% one-day VaR is used to determine regulatory VaR exceptions. In addition, the daily net revenues used to determine risk management VaR exceptions (i.e., comparing the daily net revenues to the VaR measure calculated as of the end of the prior business day) include intraday activity, whereas the Capital Framework requires that intraday activity be excluded from daily net revenues when calculating regulatory VaR exceptions. Intraday activity includes bid/offer net revenues, which are more likely than not to be positive by their nature. As a result, there may be differences in the number of VaR exceptions and the amount of daily net revenues calculated for regulatory VaR compared to the amounts calculated for risk management VaR.

In accordance with the market risk section of the Capital Framework, the firm evaluates the accuracy of its VaR model through daily backtesting. The results of the backtesting determine the size of the VaR multiplier used to compute RWAs.

The tables below present, by risk category, the firm's period-end, high, low and mean of the average daily regulatory VaR. Average, per the market risk regulatory capital requirements, is determined based on the average daily regulatory VaR over the preceding 60 business days.

Table 11: Regulatory VaR

<i>\$ in millions</i>	As of December 2022
Regulatory VaR	\$ 506
VaR x Multiplier	\$ 1,519
RWAs	\$ 18,981

<i>\$ in millions</i>	As of December 2022	Three Months Ended December 2022		
		High	Low	Mean
Regulatory VaR	\$ 506	\$ 588	\$ 502	\$ 537
Interest rates	536	545	528	536
Equity prices	139	160	139	151
Currency rates	94	118	94	110
Commodity prices	124	240	124	181
Diversification effect	\$ (387)			\$ (441)

In the tables above:

- Regulatory VaR is subject to a regulatory multiplier that is set at a minimum of three (which is the multiplier used in this table) and can be increased up to four, depending upon the number of backtesting exceptions. See “Regulatory VaR Backtesting Results” for further information. This result is further multiplied by 12.5 to convert into RWAs. Calculation differences may exist due to rounding.
- The diversification effect represents the difference between total VaR and the sum of the VaRs for the four risk categories. This effect arises because the four market risk categories are not perfectly correlated.

Stressed VaR (SVaR). SVaR is the potential loss in value of trading assets and liabilities, as well as certain investments, loans, and other financial assets and liabilities accounted for at fair value, during a period of significant market stress. SVaR is calculated at a 99% confidence level over a 10-day horizon using market data inputs from a continuous 12-month period of stress. The firm identifies the stressed period by comparing VaR using market data inputs from different historical periods.

Pillar 3 Disclosures

The table below presents the firm's period-end, high, low and mean of the average weekly SVaR. Average, per the market risk regulatory capital requirements, is determined based on the average weekly amount for the preceding 12 weeks.

Table 12: Stressed VaR

\$ in millions	As of December 2022	Three Months Ended December 2022		
		High	Low	Mean
SVaR	\$ 1,009	\$ 1,009	\$ 910	\$ 955
SVaR x Multiplier	\$ 3,027			
RWAs	\$ 37,833			

In the table above, SVaR is subject to the same regulatory multiplier used for regulatory VaR and is further multiplied by 12.5 to convert into RWAs. Calculation differences may exist due to rounding.

Incremental Risk. Incremental risk is the potential loss in value of non-securitized positions due to the default or credit migration of issuers of financial instruments over a one-year time horizon. As required by the market risk section of the Capital Framework, this measure is calculated at a 99.9% confidence level over a one-year time horizon. The model is based on the assumption of a constant level of risk. The liquidity horizons are determined based on the speed at which issuer exposures can be reduced by hedging or unwinding, given the firm's experience during a historical stress period, and the prescribed regulatory minimum. The model uses a multi-factor approach to simulate correlated rating migration and default events, and takes into account various characteristics, including region, industry, basis between different products, credit quality and maturity of the debt.

The table below presents the firm's period-end, high, low and mean of the maximum of the average weekly incremental risk measure or the point-in-time measure. Average, per the market risk regulatory capital requirements, is determined based on the average weekly amount over the preceding 12 weeks.

Table 13: Incremental Risk

\$ in millions	As of December 2022	Three Months Ended December 2022		
		High	Low	Mean
Incremental risk	\$ 518	\$ 874	\$ 518	\$ 662
RWAs	\$ 6,470			

In the table above, incremental risk is multiplied by 12.5 in order to convert the results into RWAs. Calculation differences may exist due to rounding.

Comprehensive Risk. Comprehensive risk is the potential loss in value, due to price risk and defaults, within the firm's credit correlation positions. A credit correlation position is defined as a securitization position for which all or substantially all of the value of the underlying exposures is based on the credit quality of a single company for which a two-way market exists, or indices based on such exposures for which a two-way market exists, or hedges of these positions (which are typically not securitization positions).

As required by the market risk section of the Capital Framework, comprehensive risk consists of a model-based measure, subject to a floor based on the standardized measurement method. The model-based measure is calculated at a 99.9% confidence level over a one-year time horizon applying a constant level of risk. The model comprehensively covers price risks, including nonlinear price effects and takes into account contractual structure of cash flows, the effect of multiple defaults, credit spread risk, volatility of implied correlation, recovery rate volatility and basis risk. The liquidity horizon is based on the firm's experience during a historical stress period, subject to the prescribed regulatory minimum.

The floor is 8% of the standardized specific risk add-on. See "Specific Risk – Securitization Positions" below for further information about the calculation of the add-on for securitization positions, and see "Specific Risk – Other Specific Risk Positions" below for further information about the calculation of the add-on for hedges.

As of December 2022, the firm had credit correlation positions, subject to the comprehensive risk measure, with a fair value of \$391 million in net liabilities.

The table below presents the firm's period-end, high, low and mean of the maximum of the average weekly comprehensive risk measure or the point-in-time measure, inclusive of both modeled and non-modeled components. Average, per the market risk regulatory capital requirements, is determined based on the average weekly amount for the preceding 12 weeks.

Table 14: Comprehensive Risk

\$ in millions	As of December 2022	Three Months Ended December 2022		
		High	Low	Mean
Comprehensive Risk	\$ 291	\$ 291	\$ 256	\$ 270
RWAs	\$ 3,641			

In the table above, comprehensive risk is multiplied by 12.5 in order to convert the results into RWAs. Calculation differences may exist due to rounding.

Pillar 3 Disclosures**Model Review and Validation**

The models discussed above, which are used to determine regulatory VaR, SVaR, incremental risk and comprehensive risk, are independently reviewed, validated and approved by Model Risk. See “Model Risk” for further information.

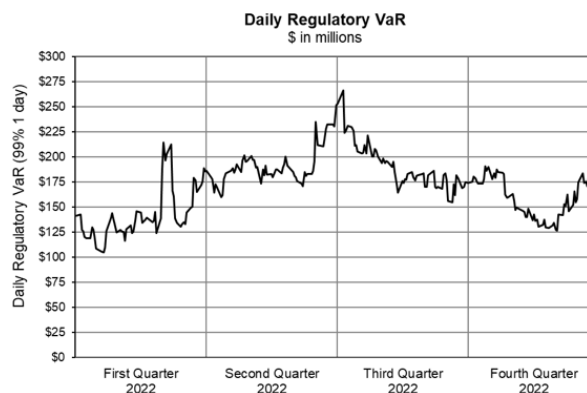
Regulatory VaR Backtesting Results

As required by the market risk section of the Capital Framework, the firm validates the accuracy of its regulatory VaR models by backtesting the output of such models against the daily positional loss results. The actual number of exceptions (that is, the number of business days for which the positional losses exceed the corresponding 99% one-day regulatory VaR) over the most recent 250 business days is used to determine the size of the VaR multiplier, which could increase from a minimum of three to a maximum of four, depending on the number of exceptions.

As defined in the market risk section of the Capital Framework, positional net revenues for any given day represent the impact of that day’s price variation on the value of positions held at the close of business the previous day. As a consequence, these results exclude certain revenues associated with market-making businesses, such as bid/offer net revenues, which are more likely than not to be positive by their nature. In addition, positional net revenues used in the firm’s regulatory VaR backtesting relate only to positions which are included in regulatory VaR and, as noted above, differ from positions included in risk management VaR. This measure of positional net revenues is used to evaluate the performance of the regulatory VaR model and is not comparable to the firm’s actual daily net revenues. See “Risk Management — Market Risk Management” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K.

The firm’s positional losses observed on a single day did not exceed its 99% one-day regulatory VaR during the three months ended December 2022. The firm’s positional losses observed on a single day exceeded its 99% one-day regulatory VaR on two occasions during the previous 12 months. Note that, although a one-day time horizon is used for backtesting purposes, a 10-day time horizon is used, as described earlier, to determine RWAs associated with regulatory VaR.

The chart below presents the firm’s 99% one-day regulatory VaR during the previous 12 months.

Table 15: Daily Regulatory VaR**Stress Testing**

Stress testing is a method of determining the effect of various hypothetical stress scenarios. The firm uses stress testing to examine risks of specific portfolios, as well as the potential impact of significant risk exposures. The firm uses a variety of stress testing techniques to calculate the potential loss from a wide range of market moves on its portfolios, including firmwide stress tests, sensitivity analysis and scenario analysis.

See “Risk Management – Market Risk Management – Risk Measures – Stress Testing” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for a detailed description of the firm’s stress testing practices.

Specific Risk

Specific risk is the risk of loss on a position that could result from factors other than broad market movements, including event risk, default risk and idiosyncratic risk. The specific risk add-on is applicable for both securitization positions and for certain non-securitized debt and equity positions, to supplement the model-based measures, and is primarily based on supervisory prescribed risk-weighting factors and methodologies.

The table below presents the RWAs of the firm’s non-model-based specific risk measure on securitization (excluding credit correlation positions captured by the comprehensive risk measure) and non-securitization positions.

Table 16: Specific Risk

<i>\$ in millions</i>	As of December 2022
Securitization positions	\$ 10,815
Other specific risk positions	5,534
Total specific risk RWAs	\$ 16,349

Securitization Positions. The securitization section of the Capital Framework is used to calculate the RWAs for any covered position that has been identified as a securitization or resecuritization. See “Securitized in the Banking Book” for further information about the regulatory definition of a securitization and of the hierarchy of approaches used within the securitization section of the Capital Framework to calculate regulatory capital requirements. Products covered by the regulatory definition of a securitization include mortgage-backed securities (MBS) and other asset-backed securities (ABS), derivatives referencing MBS or ABS, or derivatives referencing indices of MBS or ABS, which are held in inventory. The population includes positions purchased in the secondary market, as well as retained interests in securitization structures the firm sponsors. Consistent with the Capital Framework, this notably excludes mortgage-backed pass-through securities guaranteed by government-sponsored entities (for example, Federal National Mortgage Association).

The RWAs for trading book securitization positions are calculated by multiplying the exposure amount by the specific risk-weighting factors assigned and then multiplying by 12.5. The exposure amount is defined as the carrying value for securities, or the market value of the effective notional of the instrument or indices underlying derivative positions. The securitization capital requirements are the greater of the capital requirements on the net long or short exposure (incorporating applicable netting), and are capped at the maximum loss that could be incurred on any given transaction.

The table below presents the firm’s aggregate on-balance sheet and off-balance sheet trading book securitization exposures (excluding credit correlation positions captured by the comprehensive risk measure) by underlying exposure type. Amounts below reflect securitization exposures, as defined for regulatory capital purposes and are not comparable to securitization measures reported in Note 16 “Securitization Activities” in Part II, Item 8 “Financial Statements and Supplementary Data” in the 2022 Form 10-K.

Table 17: Trading Book Securitization Exposures

<i>\$ in millions</i>	As of December 2022
Residential mortgages	\$ 1,224
Commercial mortgages	2,070
Corporates	989
Asset-backed and other	647
Total securitization exposures	\$ 4,930

In the table above:

- Corporates reflect corporate collateralized debt and loan obligations.
- Total securitization exposures included securities with a fair value of \$3.33 billion.

Securitization positions, including resecuritizations, are incorporated into the firm’s overall risk management approach for financial instruments. See “Risk Management – Market Risk Management” and “Risk Management – Credit Risk Management” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for a detailed discussion of the firm’s risk management process and practices.

Other Specific Risk Positions. The standard specific risk add-on for debt positions ranges from 0.25% to 12%, other than for certain sovereign and supranational positions which have a 0% add-on. The add-on for sovereigns, PSEs and depository institutions is based on the Organization for Economic Co-operation and Development country risk classifications of the sovereign and the remaining contractual maturity of the position. The add-on for corporate entities that have issued public financial instruments is based on internal assessments of creditworthiness and the remaining contractual maturity of the position. All other types of debt positions are subject to an 8% add-on. The standard specific risk add-on for equity positions will generally be 8%, but this could decrease to 2% for well-diversified portfolios of equities, certain indices, and certain futures-related arbitrage strategies. The standard specific risk RWAs for debt and equity positions are calculated by multiplying the exposure amount by the appropriate standard specific risk add-on, and then multiplying by 12.5. The exposure amount is defined as the carrying value for securities and loans, or the market value of the effective notional of the instrument or indices underlying derivative positions. The specific risk capital requirements are capped at the maximum loss that could be incurred on any given transaction.

Operational Risk

Overview

Operational risk is the risk of an adverse outcome resulting from inadequate or failed internal processes, people, systems or from external events. The firm's exposure to operational risk arises from routine processing errors, as well as extraordinary incidents, such as major systems failures or legal and regulatory matters.

Potential types of loss events related to internal and external operational risk include:

- Execution, delivery and process management;
- Business disruption and system failures;
- Employment practices and workplace safety;
- Clients, products and business practices;
- Damage to physical assets;
- Internal fraud; and
- External fraud.

Operational Risk, which is independent of the firm's revenue-producing units and reports to the chief risk officer, has primary responsibility for developing and implementing a formalized framework for assessing, monitoring and managing operational risk with the goal of maintaining its exposure to operational risk at levels that are within the firm's risk appetite.

Operational Risk Management Process

The firm's process for managing operational risk includes the critical components of the risk management framework described in "Risk Management – Overview and Structure of Risk Management" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K, including a comprehensive data collection process, as well as firmwide policies and procedures, for operational risk events.

The firm combines top-down and bottom-up approaches to manage and measure operational risk. From a top-down perspective, the firm's senior management assesses firmwide and business-level operational risk profiles. From a bottom-up perspective, the firm's first and second lines of defense are responsible for risk identification and risk management on a day-to-day basis, including escalating operational risks and risk events to senior management.

The firm maintains a comprehensive control framework designed to provide a well-controlled environment to minimize operational risks. The Firmwide Operational Risk and Resilience Committee is responsible for overseeing operational risk, and for ensuring the operational resilience of the firm's business.

The firm's operational risk management framework is designed to comply with the operational risk measurement rules under the Capital Framework and has evolved based on the changing needs of the firm's businesses and regulatory guidance.

The firm has established policies that require all employees and consultants to report and escalate operational risk events. When operational risk events are identified, the firm's policies require that the events be documented and analyzed to determine whether changes are required in the firm's systems and/or processes to further mitigate the risk of future events.

The firm uses operational risk management applications to capture, analyze, aggregate and report operational risk event data and key metrics. One of the firm's key risk identification and control assessment tools is an operational risk and control self-assessment process, which is performed by the firm's managers. This process consists of the identification and rating of operational risks, on a forward-looking basis, and the related controls. The results from this process are analyzed to evaluate operational risk exposures and identify businesses, activities or products with heightened levels of operational risk.

Risk Measurement

The firm measures operational risk exposure using both statistical modeling and scenario analyses, which involve qualitative and quantitative assessments of internal and external operational risk event data and internal control factors for each of the firm's businesses. Operational risk measurement also incorporates an assessment of business environment factors, including:

- Evaluations of the complexity of the firm's business activities;
- The degree of automation in the firm's processes;
- New activity information;
- The legal and regulatory environment; and
- Changes in the markets for the firm's products and services, including the diversity and sophistication of customers and counterparties.

Pillar 3 Disclosures

The results from these scenario analyses are used to monitor changes in operational risk and to determine business lines that may have heightened exposure to operational risk. These analyses are used in the determination of the appropriate level of operational risk capital to hold.

Regulatory Capital Measurement

In accordance with the Advanced Measurement Approach of the Capital Framework, which provides a methodology for a bank to calculate capital requirements for Operational Risk, the firm employs a Scenario-Based Approach (SBA) model that incorporates qualitative and quantitative data elements. Scenario analysis is conducted across a matrix of businesses and centralized corporate functions throughout the firm and across their applicable operational risk categories: clients, products and business practices; execution, delivery and process management; business disruption and system failures; employment practices and workplace safety; damage to physical assets; internal fraud; and external fraud. Each intersection of a business or corporate function and a risk category is referred to as a risk class. For each risk class, internal loss data, external data, business environment and internal control factors and judgment are used to develop and substantiate estimates of the likely frequency and severity of operational risk losses over a twelve-month time horizon. These estimates are used as inputs to produce two separate distributions (one for frequency, one for severity) which are then combined for each risk class. The results for all risk classes are aggregated, taking into consideration the possibility of correlations between them. The SBA model calculates operational risk capital requirements for the firm at the 99.9th percentile confidence level.

For a subset of risks in the firm's operational risk capital determination, it incorporates insurance as a risk transfer mechanism. The firm continues to seek opportunities to use compliant insurance, where appropriate.

Model Review and Validation

The statistical models used to measure operational risk exposure are independently reviewed, validated and approved by Model Risk. See "Model Risk" for further information.

Model Risk**Overview**

Model risk is the potential for adverse consequences from decisions made based on model outputs that may be incorrect or used inappropriately. The firm relies on quantitative models across its business activities primarily to value certain financial assets and liabilities, to monitor and manage risk, and to measure and monitor regulatory capital.

Model Risk, which is independent of the firm's revenue-producing units, model developers, model owners and model users, and reports to the chief risk officer, has primary responsibility for assessing, monitoring and managing model risk through firmwide oversight across the firm's global businesses, and provides periodic updates to senior management, risk committees and the Risk Committee of the Board.

The firm's model risk management framework is managed through a governance structure and risk management controls, which encompass standards designed to ensure it maintains a comprehensive model inventory, including risk assessment and classification, sound model development practices, independent review and model-specific usage controls. The Firmwide Model Risk Control Committee oversees the firm's model risk management framework.

Model Review and Validation Process

Model Risk consists of quantitative professionals who perform an independent review, validation and approval of the firm's models. This review includes an analysis of the model documentation, independent testing, an assessment of the appropriateness of the methodology used, and verification of compliance with model development and implementation standards.

The firm regularly refines and enhances its models to reflect changes in market or economic conditions and business mix. All models are reviewed on an annual basis, and new models or significant changes to existing models and their assumptions are approved prior to implementation.

The model validation process incorporates a review of models and trade and risk parameters across a broad range of scenarios (including extreme conditions) in order to critically evaluate and verify:

- The model's conceptual soundness, including the reasonableness of model assumptions, and suitability for intended use;
- The testing strategy utilized by the model developers to ensure that the models function as intended;
- The suitability of the calculation techniques incorporated in the model;
- The model's accuracy in reflecting the characteristics of the related product and its significant risks;
- The model's consistency with models for similar products; and
- The model's sensitivity to input parameters and assumptions.

Pillar 3 Disclosures

See “Critical Accounting Policies – Fair Value – Review of Valuation Models,” “Risk Management – Liquidity Risk Management,” “Risk Management – Market Risk Management,” “Risk Management – Credit Risk Management” and “Risk Management – Operational Risk Management” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K and “Credit Risk,” “Market Risk,” and “Operational Risk” in this document for further information about the use of models within these areas.

Interest Rate Sensitivity**Earnings-at-Risk (EaR)**

Beginning in the fourth quarter of 2022, the firm started managing interest rate risk using the EaR metric. EaR measures the estimated impact of changes in interest rates to our net revenues and preferred stock dividends over a defined time horizon.

Treasury manages the aggregated interest rate risk from all businesses through its investment securities portfolio and interest rate derivatives. Risk, which is independent of our revenue-producing units, and Treasury, have primary responsibility for assessing and monitoring EaR through firmwide oversight, including oversight of EaR stress testing and assumptions, and the establishment of the EaR risk appetite.

The table below presents the impact of a parallel shift in rates on net revenues and preferred stock dividends over the next 12 months relative to the baseline scenario, which takes into consideration, among other things, the market’s expectation of forward rates, as well as the firm’s expectation of future business activity.

<i>\$ in millions</i>	As of December 2022
+100 basis points parallel shift in rates	\$ 104
-100 basis points parallel shift in rates	\$ (104)

In the table above, the EaR metric utilized various assumptions, including, among other things, balance sheet size and composition, deposit repricing and prepayment behavior, all of which have inherent uncertainties. The EaR metric does not represent a forecast of net revenues and preferred stock dividends.

See "Risk Management - Market Risk Management" in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the 2022 Form 10-K for further information about Earnings-at-Risk.

Forward-Looking Statements

The firm has included in these disclosures, and management may make, statements that may constitute “forward-looking statements” within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements are not historical facts or statements of current conditions, but instead represent only the firm’s beliefs regarding future events, many of which, by their nature, are inherently uncertain and outside of the firm’s control. These statements may relate to, among other things, (i) the firm’s future plans and results, (ii) the objectives and effectiveness of the firm’s risk management and liquidity policies, and (iii) the effect of changes to the regulations, and the firm’s future status, activities or reporting under banking and financial regulation. See “Forward-Looking Statements” in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the 2022 Form 10-K for further information about forward-looking statements.

It is possible that the firm’s actual results and financial condition may differ, possibly materially, from the anticipated results and financial condition in these forward-looking statements. Important factors that could cause the firm’s results and financial condition to differ from those in these statements include, among others, those described in “Risk Factors” in Part I, Item 1A in the 2022 Form 10-K.

Index of References

Category	Description	December 2022	
		Pillar 3 Report page reference	Form 10-K page reference
Scope of Application	Basis of Consolidation	3	127-128
	Restrictions on the Transfer of Funds or Regulatory Capital within the Firm	4	96, 203
Capital Adequacy	Capital Management	4	83-87
	Advanced Risk-Based Capital Ratios	5	195-196
	Advanced Risk-Weighted Assets	7	198-200
Supplementary Leverage Ratio	Supplementary Leverage Ratio	5	196
Capital Structure	Terms and Conditions of Capital Instruments	6-7	176-179, 182, 192-194
	Capital Components	6-7	195-198
Credit Risk: General Disclosures	Credit Risk Overview and Credit Risk Management Process	8	106
	Model Review and Validation	12, 26-27	117
	Past Due Loans, Loans on Nonaccrual Status, and Allowance for Credit Losses	9	165-169
Credit Risk: Internal Ratings Based Approach and Counterparty Credit Risk	Credit Risk Exposures, including Derivative and Securities Financing Transaction Exposures	9-13	108-109, 113, 141-142, 152-153, 172-173
	Parameter Definition, Estimation Methods, and Governance and Validation of Risk Parameters	10-12	-
	Credit Risk Wholesale Exposures and Retail Exposures by PD Band	11-12	-
	Credit Derivatives	13	154-156
	Counterparty Netting and Collateral Management	12-13	106-109, 131-132
Credit Risk Mitigation	Investing and Financing Exposures Covered by Credit Derivatives	13	-
	Equity Exposures in the Banking Book	14-15	-
Securitizations in the Banking Book	Overview and Risk Management	14-15	-
	Equity Exposures by Risk Weight	16	-
	Overview, Activity and Objectives	17-18	-
Market Risk	Securitization Exposures and Risk-Weighted Assets	19	-
	Current Year Securitization Activity	20	-
	Market Risk Overview	20	101
Operational Risk	Regulatory VaR, Stressed VaR, Incremental Risk, Comprehensive Risk and Specific Risk	21-24	198-199
	Model Review and Validation	23, 26-27	117
	Regulatory VaR Backtesting Results	23	199
	Stress Testing	23	103
	Operational Risk Overview	25	115
Model Risk	Advanced Measurement Approach	26-27	199
	Model Review and Validation	26-27	117
	Overview, Model Review and Validation	26-27	116-117
Interest Rate Risk in the Banking Book	Earnings-at-Risk	27	102, 105