



The Goldman Sachs Group, Inc.

2019 Mid-Cycle Dodd-Frank Act Stress Test Disclosure

October 2019

2019 Mid-Cycle Dodd-Frank Act Company-Run Stress Test Disclosure

Overview and Requirements

For the Mid-Cycle U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) Stress Test (Mid-Cycle DFAST) completed in October of each year, The Goldman Sachs Group, Inc. (referred to herein as “Group Inc.,” “we,” “us” and “our”) is currently required to conduct stress tests using a set of internally developed macroeconomic scenarios (internal baseline, internal adverse and internal severely adverse).

Stress testing is an integral component of our internal processes to assess our capital adequacy and to ensure that we hold an appropriate amount of capital relative to the risks of our businesses.

The 2019 Mid-Cycle DFAST is not conducted under the Board of Governors of the Federal Reserve System’s (FRB) Capital Plan Rule and is not part of the annual Comprehensive Capital Analysis and Review process. Accordingly, the FRB does not provide an objection or non-objection to an institution’s Mid-Cycle DFAST results. Firms are currently required to conduct the Mid-Cycle DFAST in accordance with the requirements of the FRB’s DFAST rules.

In October 2019, the FRB eliminated the requirement to conduct the company run Mid-Cycle DFAST stress test beginning in 2020.

We are required to calculate our 2019 Mid-Cycle DFAST in accordance with the regulations of the FRB (Capital Framework). These regulations are largely based on the Basel Committee on Banking Supervision’s capital framework for strengthening international capital standards (Basel III) and also implement certain provisions of the Dodd-Frank Act. 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.

We are required to calculate risk-based Common Equity Tier 1 (CET1) capital, Tier 1 capital and Total capital ratios for all quarters of the planning horizon in accordance with the Standardized approach and market risk rules set out in the Capital Framework (together, the Standardized Capital Rules). We are also required to calculate a Tier 1 leverage ratio for all quarters, using the Capital Framework definition of Tier 1 capital in the numerator and adjusted total assets (which includes adjustments for certain capital deductions) in the denominator. We are also required to calculate a supplementary leverage ratio (SLR) for all quarters of the planning horizon. The SLR compares Tier 1 capital to a measure of leverage exposure, which consists of total assets for the quarter and certain off-balance-sheet exposures (which include a measure of derivatives, securities financing transactions, commitments and guarantees), less certain balance sheet deductions.

The planning horizon for the 2019 Mid-Cycle DFAST is the third quarter of 2019 through and including the third quarter of 2021.

Minimum Regulatory Ratio Requirements

The table below presents the FRB’s minimum risk-based capital and leverage ratios applicable to us over the planning horizon in the Mid-Cycle DFAST stress test.

Minimum Ratio	
CET1 capital ratio	4.5%
Tier 1 capital ratio	6.0%
Total capital ratio	8.0%
Tier 1 leverage ratio	4.0%
SLR	3.0%

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Overview and Description of Group Inc.'s Severely Adverse Scenario

The firm's nine-quarter internally developed severely adverse scenario is characterized by a stressed global macroeconomic environment, including severe recessions in the U.S., Eurozone, U.K., Japan and an economic slowdown in developing Asia. The scenario begins with a global market shock, which is a repricing of our trading positions, private equity positions and counterparty exposures. In addition to the global market shock, we include the impact of the default of a large counterparty during the first quarter of the planning horizon. The planning horizon includes a decline in gross domestic product (real GDP), a rising rate of unemployment, a low-interest rate environment, declining asset values and widening credit spreads across global economic regions. This is followed by a slow and partial recovery. We also incorporate a firm-specific event, which further reduces our franchise revenues.

In this scenario, we project variables across a range of macroeconomic indicators and asset classes that management determines are necessary to produce revenue, expense, balance sheet and RWA projections. For example:

GDP and Unemployment. U.S. real GDP declines 6.25% over the first six quarters of the planning horizon. From the trough in the fourth quarter of 2020, U.S. real GDP experiences growth of approximately 0.8% over the remainder of the planning horizon. The U.S. unemployment rate increases from 3.7% in the second quarter of 2019 to a peak of 9.8% at the end of the planning horizon.

Equity Markets and Volatility. Equity market indices experience sharp declines over the first five quarters of the planning horizon, with the S&P 500 Index decreasing 51% by the third quarter of 2020. The VIX increases from 21 to a peak of 80 in the first quarter of 2020. The S&P 500 Index partially recovers over the remainder of the planning horizon, ending 28% below the second quarter of 2019 starting point. The VIX gradually decreases to 26 over the remainder of the planning horizon.

U.S. Interest Rates and Credit Spreads. The 3-month U.S. Treasury (UST) yield declines to 10 basis points by the third quarter of 2020 and remains at that level through the remainder of the planning horizon. Additionally, the 10-year UST yield decreases by 100 basis points to its trough in the third quarter of 2020 and stays at approximately that level through the remainder of the planning horizon. By the third quarter of 2020, U.S. investment-grade credit spreads widen by approximately 170 basis points above the second quarter of 2019 starting point and by the third quarter of 2020, U.S. high yield spreads widen by approximately 1,120 basis points. U.S. investment-grade and U.S. high yield spreads gradually contract over the remainder of the planning horizon, though they still remain higher than their second quarter of 2019 starting points.

Similarly, international economies experience declines in real GDP and equity markets, as well as widening credit spreads.

Given the extensive use of fair value accounting in our balance sheet, we believe the inclusion of a global market shock is a meaningful way for us to stress our risks and exposures as significant and rapid changes in asset values are particularly impactful to our capital position. We design a shock that we believe captures, and appropriately stresses, our material risk positions. Furthermore, as the scenario includes a severely adverse operating environment, characterized by further market deterioration in global asset values and a firm-specific event, we believe the scenario captures our idiosyncratic risks and significantly stresses our capital position. We believe our severely adverse scenario represents a low probability, but high impact scenario, though it does not reflect our forecast of likely macroeconomic conditions over the planning horizon.

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Summary of Results

The table below presents the results of our calculations under our severely adverse scenario over the planning horizon, including the instantaneous global market shock and counterparty default scenario applied to our trading and counterparty exposures, respectively.

These results incorporate the following capital action assumptions, as prescribed by the FRB's DFAST rules:

- Actual capital actions for the third quarter of 2019; and
- For each of the remaining quarters in the planning horizon:
 - common stock dividends equal to the quarterly average dollar amount of common stock dividends that were paid in the fourth quarter of 2018 through and including the third quarter of 2019; and
 - payments on any other instrument that is eligible for inclusion in the numerator of a regulatory capital ratio equal to the stated dividend, interest or principal due on such an instrument during the quarter.

Based on our severely adverse scenario, the most significant drivers impacting our capital ratios over the planning horizon are:

- Trading and counterparty losses, which include the global market shock, the counterparty default scenario, and trading and counterparty incremental default risk losses;
- Stress Pre-Provision Net Revenues (PPNR) and operational risk losses; and
- Stress provisions and other losses in our loans and lending commitments

These results are prepared based on our internal stress testing methodology and our internally developed severely adverse scenario and therefore will not be comparable to the 2019 Annual DFAST results for our calculations based on the FRB's supervisory severely adverse scenario and instructions.

Additionally, the Mid-Cycle DFAST results are based on the current Mid-Cycle DFAST requirements and do not incorporate the proposed Stress Capital Buffer requirements.

2019 Mid-Cycle DFAST Results
The Goldman Sachs Group, Inc. Estimates in our Severely Adverse Scenario
Projected Capital Ratios, RWAs, Loan Losses and Net Loss Before Taxes

These results are calculated using capital action assumptions required by the FRB's DFAST rules. All projections represent hypothetical estimates that involve an economic outcome that is more adverse than expected. These estimates are not forecasts.

Table 1

Actual Q2 2019 and Projected Capital Ratios through Q3 2021 under our Severely Adverse Scenario

Regulatory Ratio	Actual Q2 2019	Projected Stressed Capital Ratios	
		Ending	Minimum
CET1 capital ratio (%)	13.8	7.1	6.9
Tier 1 capital ratio (%)	15.8	9.0	8.7
Total capital ratio (%)	18.5	11.7	11.5
Tier 1 leverage ratio (%)	9.1	6.0	6.0
SLR (%)	6.4	4.1	4.0

In the table above, the lowest calculated capital ratios (minimum) from the third quarter of 2019 through the third quarter of 2021 are presented.

Table 3

Projected Loan Losses by Type of Loan from Q3 2019 through Q3 2021 under the Severely Adverse Scenario

Loan Type	\$ in billions	Portfolio Loss Rates (%)
Loan Losses	\$8.3	7.2%
First Lien Mortgages, Domestic	0.3	18.4
Junior Liens and HELOCs, Domestic	0.0	0.0
Commercial and Industrial	2.3	7.4
Commercial Real Estate, Domestic	0.5	8.1
Credit Cards	1.3	18.2
Other Consumer	1.2	16.9
Other Loans	2.7	4.3

In the table above:

- Loan losses and average loan balances used to calculate portfolio loss rates excludes loans and lending commitments held for sale or accounted for under the fair value option.
- For reporting purposes, provisions on our purchased credit impaired portfolio included in Table 4 are also included in loan losses in Table 3.

Table 2

Actual Q2 2019 and Projected RWAs through Q3 2021 under the Severely Adverse Scenario

Item	Actual Q2 2019	Projected Q3 2021
RWAs (\$ in billions)	547.7	589.7

Table 4

Projected PPNR, Losses and Net Loss Before Taxes from Q3 2019 through Q3 2021 under the Severely Adverse Scenario

Item	\$ in billions	Average Assets (%)
PPNR	\$6.9	0.8%
Other Revenue	-	
Less:		
Provision for Loan Losses	10.2	
Realized Losses/(Gains) on Securities	-	
Trading and Counterparty Losses	25.5	
Other Losses/(Gains)	4.1	
Equals:		
Net Loss Before Taxes	(32.9)	(3.8)

In the table above:

- PPNR includes net revenues and operating expenses (including operational risk events and other real estate owned costs).
- Trading and counterparty losses includes mark-to-market losses, trading incremental default risk losses on positions held at fair value and changes in credit valuation adjustment (CVA) and other counterparty credit losses, as a result of the global market shock and the impact of the counterparty default scenario. Subsequent trading and counterparty incremental default risk losses over the planning horizon are also included.
- Other losses/(gains) primarily includes projected changes in the fair value of loans and lending commitments which are held for sale or accounted for under the fair value option, and their associated hedges.

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Material Risks Captured in the Stress Test Market Risk

Market risk is the risk of loss in the value of our inventory, as well as certain other financial assets and financial liabilities, due to changes in market conditions. We employ a variety of risk measures to monitor market risk. We hold inventory primarily for market making for our clients and for our investing and lending activities. Our inventory, therefore, changes based on client demands and our investment opportunities. Our inventory is accounted for at fair value and therefore fluctuates on a daily basis. 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 is incorporated into our 2019 Mid-Cycle DFAST results under our severely adverse scenario via the global market shock and the macroeconomic scenario. The global market shock is applied to our fair value positions with changes in the fair value being reflected in our revenue projections in the first quarter of the planning horizon.

In addition to the global market shock, trading incremental default risk losses are estimated over the planning horizon.

We further stress our positions based on the prescribed changes in macroeconomic variables and asset values over the planning horizon.

Credit Risk

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 we hold. Our 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 is incorporated into our 2019 Mid-Cycle DFAST results under our severely adverse scenario via the global market shock, the counterparty default scenario and the macroeconomic scenario. The global market shock includes counterparty credit losses (i.e., from credit valuation adjustments (CVA) and other counterparty credit losses). The counterparty default scenario may include counterparty credit losses due to defaults on OTC derivatives and securities financing transactions. Along with the global market shock, the counterparty default scenario is assumed to occur in the first quarter of the planning horizon. Projections for CVA and other counterparty credit losses over the planning horizon are also included in our revenue projections.

Credit risk is also incorporated into our projections for changes in provisions and loan losses on our portfolio of loans held for investment that are accounted for at amortized cost. Lending and commitments include the wholesale and consumer lending portfolios. For wholesale lending we utilize a model that estimates losses based on projections of the probability of default, loss given default, exposure at default and rating migration, which is segmented by industry classification and region for our loans receivable. For consumer lending we utilize a model that estimates losses based on the projected growth and change in the creditworthiness of the borrower. We also include projections of estimated defaults and associated losses on our loans and lending commitments, which are held for sale or accounted for under the fair value option.

Per the FRB's instructions, our 2019 Mid-Cycle DFAST Severely Adverse Scenario results do not incorporate the impact of adopting the Current Expected Credit Loss model.

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Operational Risk

Operational risk is the risk of an adverse outcome resulting from inadequate or failed internal processes, people, systems or from external events. Our 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:

- 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.

Operational risk, including litigation-related losses, is incorporated into our 2019 Mid-Cycle DFAST results with losses estimated based on our historical operational risk experience, relevant internal factors, including our operational risk and control self-assessment results, scenario analysis, recent industry matters and the assumed conditions of our severely adverse scenario. Operational risk losses are included within operating expense projections over the planning horizon.

Liquidity Risk

Liquidity risk is the risk that we will be unable to fund ourselves or meet our liquidity needs in the event of firm-specific, broader industry or market liquidity stress events. We have in place a comprehensive and conservative set of liquidity and funding policies. Our principal objective is to be able to fund ourselves and to enable our core businesses to continue to serve clients and generate revenues, even under adverse circumstances.

For purposes of the 2019 Mid-Cycle DFAST, we analyzed how we would manage our balance sheet through the duration of a severe crisis and we included assumptions regarding our ability to access the secured and unsecured funding markets to generate incremental liquidity. Our 2019 Mid-Cycle DFAST results took into account certain liquidity risks by projecting potential liquidity outflows due to our severely adverse scenario environment (e.g., draws on unfunded commitments and secured and unsecured funding roll-offs without replacement) and the impact of these outflows on our liquidity position and balance sheet. Additionally, we projected increased funding costs.

Description of Our Projection Methodologies

PPNR

PPNR includes revenues and operating expenses.

Revenues. We project revenues for each of our four business segments: Investment Banking, Institutional Client Services, Investing & Lending and Investment Management.

When projecting revenues for these four segments, we utilize multiple approaches, including models based on regression analyses, management's judgment and repricing inventory due to the projected changes in asset values under our severely adverse scenario. We also incorporate the impact of broader industry performance during historical stressed periods to help guide management's judgment regarding our future performance in the assumed stressed operating environment. The projected revenues under our severely adverse scenario are an aggregation of projected revenues for each of these business segments.

Additionally, we incorporate an impact to our franchise revenues resulting from the assumed firm-specific event as referenced in the scenario overview and description section above. The inclusion of a firm-specific event in our severely adverse scenario projections inherently incorporates some level of management judgment, specifically regarding the ways in which the event impacts our projected results. When assessing the impact of the firm-specific event on our results, we leverage multiple approaches, including assumed reductions in trading revenues, investment banking market share and assets under supervision.

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- **Investment Banking.** We provide a broad range of investment banking services to a diverse group of corporations, financial institutions, investment funds, and governments. Services include strategic advisory assignments with respect to mergers and acquisitions, divestitures, corporate defense activities, restructurings, spin-offs and risk management, and debt and equity underwriting of public offerings and private placements, including local and cross-border transactions and acquisition financing, as well as derivative transactions directly related to these activities.
- **Institutional Client Services.** We facilitate client transactions and make markets in fixed income, equity, currency and commodity products, primarily with institutional clients, such as corporations, financial institutions, investment funds and governments. We also make markets in and clear client transactions on major stock, options and futures exchanges worldwide and provide financing, securities lending and other prime brokerage services to institutional clients.
- **Investing & Lending.** We invest in and originate loans to provide financing to clients. These investments and loans are typically longer-term in nature. We make investments, some of which are consolidated in debt securities and loans, public and private equity securities, infrastructure and real estate entities. Some of these investments are made indirectly through funds that we manage. We also make unsecured and secured loans through our digital platforms.
- **Investment Management.** We provide investment management services and offer investment products (primarily through separately managed accounts and commingled vehicles, such as mutual funds and private investment funds) across all major asset classes to a diverse set of institutional and individual clients. We also offer wealth advisory services, including portfolio management and financial planning and counseling, and brokerage and other transaction services to high-net-worth individuals and families.

Operating Expenses. Operating expense projections over the planning horizon include:

- Compensation and benefits expense which include salaries, estimated year-end discretionary compensation, amortization of equity awards and other items such as benefits. Discretionary compensation is significantly impacted by, among other factors, the level of net revenues, overall financial performance, prevailing labor markets, business mix, the structure of our share-based compensation programs and the external environment.
- Expenses that vary with levels of business activity, such as brokerage, clearing, exchange and distribution fees and market development costs.
- Expenses that relate to our global footprint and overall headcount levels, such as depreciation and amortization, occupancy and communication and technology costs.
- In addition, operating expenses include operational risk losses, including litigation reserves (and corresponding legal fees), as well as any projected impairments of nonfinancial assets.

Provisions and Loan Losses

Provisions and loan losses are projected over the planning horizon using a comprehensive, model-based approach for both wholesale and consumer lending activities. The wholesale model estimates losses based on projections of the probability of default, loss given default and exposure at default, which is segmented by industry classification and region for loans receivable and lending commitments in the accrual portfolio. The consumer lending model estimates losses based on projected growth and changes in borrower credit quality.

Trading and Counterparty Losses

Trading and counterparty losses include mark-to-market losses, trading incremental default risk losses on positions held at fair value and changes in CVA and other counterparty credit losses as a result of the global market shock, as well as the impact of the counterparty default scenario. Subsequent trading and counterparty incremental default risk losses over the planning horizon are also included. We use our existing stress testing and risk management infrastructure to calculate the impact of the global market shock and to quantify the impact of the counterparty default scenario.

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Other Losses

Other losses primarily include projected changes over the planning horizon in the fair value of certain loans and lending commitments, which are held for sale or accounted for under the fair value option and their associated hedges.

Balance Sheet

Balance sheet projections are based on the macroeconomic environment and incorporate input from businesses on growth assumptions and planned activity, changes to carrying values as a result of marking our inventory to market, as well as management's judgment as to how we manage our balance sheet, funding and liquidity over the planning horizon.

We include the impact of the global market shock into our balance sheet projections under our severely adverse scenario.

Capital and RWAs

Capital projections incorporate projected net earnings, capital deductions and other changes in equity, which includes the impact of actual capital actions from the third quarter of 2019 and assumed capital actions required by the DFAST rules. Projected RWAs reflect the impact of the macroeconomic environment, such as changes in volatilities and credit spreads.

Additionally, projected RWAs and capital deductions are also impacted by the projected size and composition of our balance sheet over the planning horizon.

As noted above, we have calculated risk-based capital and leverage ratios under the Standardized Capital Rules.