

THE GOLDMAN SACHS GROUP, INC. 2019 RESOLUTION PLAN

Public Section

June 28, 2019

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Abbreviations

When we use the terms “Goldman Sachs,” “GS Group,” “the firm,” “we,” “us” and “our” in this document, we mean The Goldman Sachs Group, Inc. (Group Inc. or the parent company) and its consolidated subsidiaries. When we use the term “the Agencies,” we mean the Board of Governors of the Federal Reserve System (Federal Reserve) and the Federal Deposit Insurance Corporation (FDIC).

Unless otherwise specified, financial information is as of, or for year ended, December 31, 2018.

For convenience, we have compiled the following list of acronyms and abbreviations; they have also been defined when first used in this document.

Legal Entity Acronyms and Abbreviations

| | |
|-------------|--|
| Funding IHC | Goldman Sachs Funding LLC |
| GHLK | Goldman Sachs Services (Asia) Limited |
| GPMS | Goldman Sachs Services (Singapore) Pte. Ltd. |
| GPMU | Goldman Sachs Property Management USA LLC |
| Group Inc. | The Goldman Sachs Group, Inc. |
| GSAM | Goldman Sachs Asset Management, L.P. |
| GSAMI | Goldman Sachs Asset Management International |
| GS Bank | Goldman Sachs Bank USA |
| GS&Co. | Goldman Sachs & Co. LLC |
| GSI | Goldman Sachs International |
| GSIB | Goldman Sachs International Bank |
| GSJCL | Goldman Sachs Japan Co., Ltd. |
| GSJS | Goldman Sachs Japan Services Co., Ltd. |
| GSPM | Goldman Sachs Property Management |
| GSPW | Goldman Sachs Services LLC |
| GSSE | Goldman Sachs Services Private Limited |
| GSUL | Goldman Sachs (UK) Svc. Limited |
| JANY | J. Aron & Company LLC |

Other Acronyms and Abbreviations

| | |
|---|--|
| 2017 Resolution Plan | Plan for the rapid and orderly resolution of Goldman Sachs under the Bankruptcy Code that we submitted to the Agencies on June 30, 2017 |
| 2019 Resolution Plan | The present plan for the rapid and orderly resolution of Goldman Sachs under the Bankruptcy Code |
| 2019 Guidance | Final guidance for the 2019 and subsequent resolution plan submissions by the eight largest, complex U.S. banking organizations, published in the Federal Register on February 4, 2019 |
| Capabilities | The resolution-critical capabilities described in the 2019 Guidance that the Agencies expect us to have developed in order to demonstrate that we are able to mitigate any obstacles to the successful implementation of our preferred resolution strategy |
| Core Business Lines | Those businesses, including their associated operations, services, functions and support, the failure of which would, in the firm's view, result in a material loss of revenue, profit or franchise value |
| Critical Operations | Those operations, including their associated services functions and support, the failure or discontinuation of which would pose a threat to the financial stability of the United States, in the view of the firm or as jointly directed by the Agencies. |
| Funding Note | Subordinated funding note that is part of the Capital and Liquidity Support Agreement (CLSA), pursuant to which Group Inc. contributes assets and lends funds to Funding IHC |
| ISDA Resolution Stay Protocols | The 2015 and 2018 ISDA Resolution Stay Protocols |
| Material Entity | An entity that is significant to the maintenance of a critical operation or core business line. |
| Material Operating Entity | A material entity that is an operating entity |
| Material Service Entity | A material entity that is a service entity |
| Our Board | The Board of Directors of The Goldman Sachs Group, Inc. |
| Participating Material Entity | A material entity, other than Group Inc. or Funding IHC, that is a party to the Capital and Liquidity Support Agreement |
| Participating Material Operating Entity | A participating material entity that is an operating entity |
| Participating Material Service Entity | A participating material entity that is a service entity |

| | |
|-------------------------------|---|
| Preferred Resolution Strategy | The strategy by which, at the end of the runway, Group Inc. and J. Aron & Company LLC enter Chapter 11 bankruptcy proceedings while other material entities continue outside proceedings and wind down over time |
| Qualified Financial Contract | A financial contract that is exempt from the automatic stay that would otherwise apply with respect to a company that has entered bankruptcy, insolvency or similar proceedings. Without the exemption, creditors and counterparties would be prohibited from terminating, offsetting against collateral, or taking other mitigating action with respect to their contracts with a company in those types of proceedings. |
| Revolver | The revolving loan facility that is part of the CLSA, pursuant to which Funding IHC lends funds to Group Inc. to meet the funding and liquidity requirements of Group Inc. and Group Inc.'s subsidiaries. |
| RLAP requirement | An estimate of a material entity's projected stand-alone liquidity position over a 30-day stress period |
| Runway | The ten-day period immediately preceding Group Inc.'s bankruptcy filing |
| Volcker Rule | The rules and regulations promulgated pursuant to Section 619 of the Dodd-Frank Wall Street Reform and Consumer Protection Act |
| CLSA | Capital and Liquidity Support Agreement |
| FMU | Financial Market Utility |
| GCLA | Global Core Liquid Assets |
| IDI | Insured Depository Institution (Goldman Sachs Bank USA) |
| ISDA | International Swaps and Derivatives Association |
| RCAP | Resolution Capital Adequacy and Positioning |
| RCEN | Resolution Capital Execution Need |
| RLAP | Resolution Liquidity Adequacy and Positioning |
| RLEN | Resolution Liquidity Execution Need |
| SLA | Service Level Agreement |
| SLR | Supplementary Leverage Ratio |
| TLAC | Total Loss Absorbing Capacity |

Taxonomy of Goldman Sachs in our Resolution Plan

| Material Entities | | Participating Material Entity ¹ | Acronym or Abbreviation | Country or State of Incorporation |
|------------------------------------|--|--|-------------------------|-----------------------------------|
| Covered Company | The Goldman Sachs Group, Inc. | No | Group Inc. | Delaware |
| | Goldman Sachs & Co. LLC | Yes | GS&Co. | New York |
| Material Operating Entities | Goldman Sachs International | Yes | GSI | England |
| | Goldman Sachs Bank USA | Yes | GS Bank | New York |
| | J. Aron & Company LLC | No | JANY | New York |
| | Goldman Sachs Japan Co., Ltd | Yes | GSJCL | Japan |
| | Goldman Sachs International Bank | Yes | GSIB | England |
| | Goldman Sachs Asset Management, L.P. | Yes | GSAM | Delaware |
| | Goldman Sachs Asset Management International | Yes | GSAMI | England |
| | Goldman Sachs Funding LLC | No | Funding IHC | Delaware |
| Material Service Entities | Goldman Sachs Services Private Limited | Yes | GSSE | India |
| | Goldman Sachs Services LLC | Yes | GSPW | Delaware |
| | Goldman Sachs Property Management | Yes | GSPM | England |
| | Goldman Sachs Property Management USA LLC | Yes | GPMU | Delaware |
| | Goldman Sachs Services (Asia) Limited | Yes | GHKL | Hong Kong |
| | Goldman Sachs Services (Singapore) Pte. Ltd. | Yes | GPMS | Singapore |
| | Goldman Sachs (UK) Svc. Limited | Yes | GSUL | England |
| | Goldman Sachs Japan Services Co., Ltd. | Yes | GSJS | Japan |

Core and Non-Core Business Lines

Core Business Lines

- Investment Banking
- Institutional Client Services

Non-core Business Lines

- Investing & Lending
- Investment Management

Notes:

1. See Abbreviations for a definition of Participating Material Entity.

Cautionary Note on Forward-Looking Statements

The Resolution Plan is based on a series of hypothetical scenarios and assumptions about future events and circumstances. Accordingly, many of the statements and assessments in the Resolution Plan constitute “forward-looking statements” within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. These statements include statements, other than historical information or statements of current conditions, that relate to, among other things, our future plans, objectives and resolution strategies (including our expectations and projections regarding the implementation of those strategies), to the objectives and effectiveness of our risk management policies and practices, and to our resolution capabilities (including those regarding capital, liquidity, operational matters, legal entity rationalization and separability, and our governance mechanisms, derivatives and trading activities and Management Information Systems (MIS)). The Resolution Plan is based on many significant assumptions, including assumptions about the actions of regulators, creditors, depositors and counterparties, the ability of Group Inc. and Funding IHC to perform their obligations under the Capital and Liquidity Support Agreement in connection with the provision of liquidity to and the recapitalization of the participating material entities, the state of the capital markets and the economy and the impact of a significant loss event on Goldman Sachs. None of these assumptions may prove to be correct in an actual resolution situation. The Resolution Plan is not binding on a bankruptcy court, the Agencies or any other resolution authority, and the scenarios that we describe and the assumptions that we make in the Resolution Plan are hypothetical and do not necessarily reflect events to which we are or may become subject. In the event of the resolution of Goldman Sachs, the strategies implemented by Goldman Sachs, the Agencies or any other resolution authority could differ, possibly materially, from the strategies we have described. As a result, our actual resolution strategies, or the outcomes of our resolution strategies, could differ, possibly materially, from those we have described.

We have also included information about the status or efficacy of projects we have undertaken in connection with the shortcoming identified by the Agencies in our 2017 Resolution Plan. The statements with respect to the completion, impact and effectiveness of these projects are also forward-looking statements, and these projects may not be completely effective or have the impact we anticipate.

1. Introduction

Introduction

As required under §165(d) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, we have prepared our 2019 Resolution Plan. We believe that this plan meets the goal of ensuring that our firm could be wound down without serious adverse effects on financial stability and without extraordinary support by the United States or any other government.

Our preferred resolution strategy is consistent with a “single point of entry” strategy, under which our parent company enters bankruptcy proceedings, but most of our material entities survive because they have (or have access to) sufficient capital and liquidity to remain open and wind down their activities in a controlled manner over an extended period. At the conclusion of this process, a small number of discrete businesses have been sold to third parties, and all of our other assets have been sold or wound down. Our group structure lends itself to this strategy because our parent company issues the vast majority of our external debt, and because our core business lines are highly concentrated in a small number of material entities that already hold substantial financial resources in their own right.

Our 2019 Resolution Plan implements the Agencies’ resolution-related guidance that was published in the Federal Register on February 4, 2019 (the “2019 Guidance”). Since our 2017 submission, we have continued to improve the processes and systems that underpin our resolution plans. Some of these improvements were in response to the 2019 Guidance or specific regulatory feedback, but many were identified as a result of our ongoing review processes. The Agencies identified a shortcoming regarding the actionability of divestiture options in our 2017 Resolution Plan, and our actions to address this topic are summarized starting on page 31.

Resolution planning remains a high-priority area of focus for Goldman Sachs, and we have continued to devote substantial resources to the resolution planning process across all of our business units and geographic locations. We have consistently endeavored to build optionality into our plan and to ingrain resolution planning considerations into our everyday operations and decision-making processes, so that our firm would remain resolvable across a broad range of failure scenarios. In our planning, we emphasize key capabilities, operational readiness and flexibility to cope with stress and resolution.

We are confident that our resolution strategy could be executed successfully and our firm could be wound down in an orderly manner without jeopardizing global financial markets, requiring taxpayer support, or causing losses to the FDIC’s Deposit Insurance Fund.

2. Overview of Goldman Sachs

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Overview of Goldman Sachs

Goldman Sachs is a global investment banking, securities and investment management firm. We provide a wide range of financial services to a substantial and diversified client base that includes corporations, financial institutions, governments and individuals. As of December 2018, we had offices in over 30 countries and 46% of our headcount of 36,600 employees was based outside the Americas. During 2018, we generated 39% of our net revenues outside the Americas.

We have a growing consumer banking franchise; although it is still relatively small in comparison to our other activities, we monitor its growth and continue to evaluate its relevance to resolution planning. We do not currently participate to a significant degree in broad-based consumer or custody banking, or provide payment services. On the other hand, we do have a significant presence in global securities and derivatives markets, and a primary objective of our resolution planning efforts has been to ensure that we could exit these businesses without serious adverse consequences to the broader markets.

Our parent company, The Goldman Sachs Group, Inc. (Group Inc.), is a bank holding company and a financial holding company regulated by the Federal Reserve. Our U.S. depository institution subsidiary, GS Bank, is a New York State-chartered bank.

We report our activities in four business segments:

Investment Banking: The firm provides a broad range of investment banking services to a diverse group of corporations, financial institutions, investment funds and governments.

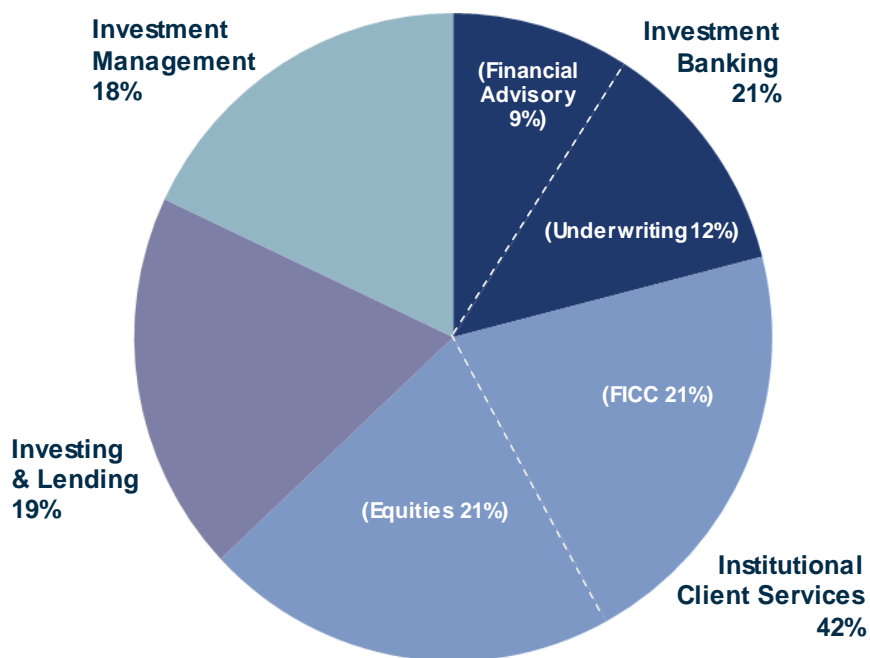
Institutional Client Services (ICS): The firm facilitates client transactions and makes markets in fixed income, equity, currency and commodity products, primarily with institutional clients, such as corporations, financial institutions, investment funds and governments. The firm also makes markets in and clears client transactions on major stock, options and futures exchanges worldwide and provides financing, securities lending and other prime brokerage services to institutional clients.

Investing & Lending: The firm invests in and originates loans to provide financing to clients. These investments and loans are typically longer-term in nature. The firm makes investments, some of which are consolidated, including through its Merchant Banking (MBD) business and its Special

Situations Group (SSG), 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 the firm manages. The firm also makes unsecured loans through its digital platform, Marcus: by Goldman Sachs, and secured loans through its digital platform, Goldman Sachs Private Bank Select.

Investment Management: The firm provides investment management services and offers 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. The firm also offers wealth advisory services provided by the firm’s subsidiary, The Ayco Company, L.P., including portfolio management and financial planning and counseling, and brokerage and other transaction services to high-net-worth individuals and families.

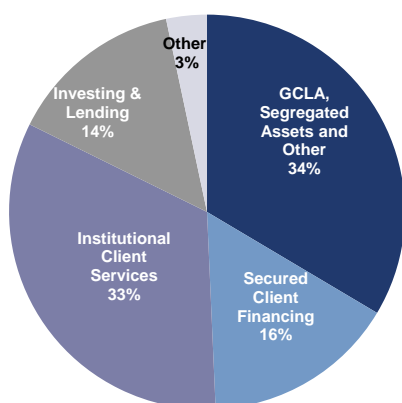
The chart below shows the split by segment of our average Net Revenues for the years 2014 to 2018:



Financial Profile

The Non-GAAP Balance Sheet Allocation¹ on the right shows that, as of 4Q18, liquid assets² (such as cash, secured financing transactions, U.S. government / agency and other financial instruments) made up approximately 90% of our \$932 billion balance sheet.

The chart below illustrates pictorially our balance sheet allocation as at December 31, 2018:



| Non-GAAP Balance Sheet Allocation as at December 31, 2018 | |
|---|---------------|
| \$ in billions | |
| Assets | |
| GCLA, segregated assets, other | \$ 313 |
| Secured client financing | 145 |
| Inventory | 204 |
| Secured financing agreements | 62 |
| Receivables | 42 |
| Institutional Client Services | 308 |
| Public equity | 1 |
| Private equity | 20 |
| Debt securities | 12 |
| Loans | 94 |
| Other | 8 |
| Investing & Lending | 135 |
| Total inventory and related assets | 443 |
| Other assets | 31 |
| Total assets | \$ 932 |
| Liabilities and Shareholders' Equity | |
| Deposits | \$ 158 |
| Financial instruments sold, but not yet purchased | 109 |
| Collateralized financings | 112 |
| Payables and other liabilities | 239 |
| Unsecured long-term borrowings | 224 |
| Total Liabilities | 842 |
| Preferred stock | 11 |
| Common equity | 79 |
| Total Shareholders' Equity | 90 |
| | \$ 932 |

It can be observed that:

- Approximately a third of our balance sheet is comprised of unencumbered, highly liquid securities that have been earmarked to meet current and potential liquidity needs (our

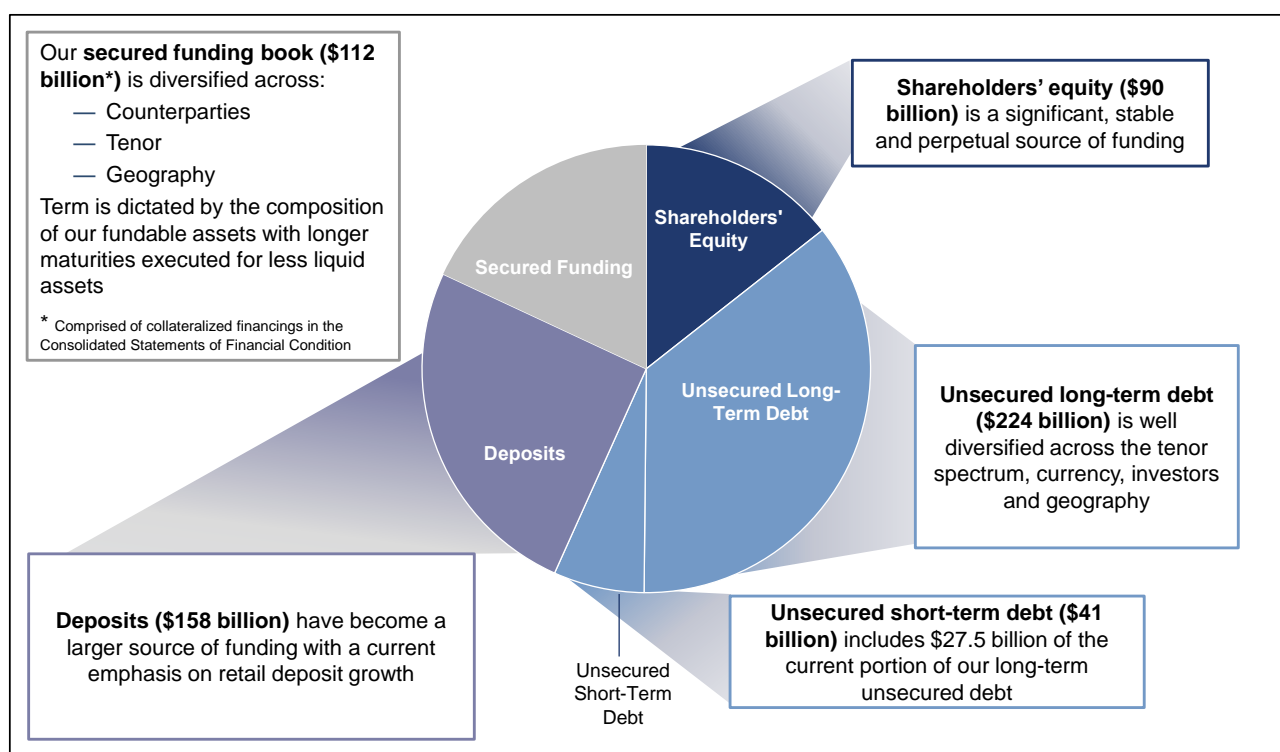
¹ This Non-GAAP Balance Sheet Allocation is an allocation of assets to our businesses. This is a non-GAAP presentation and may not be comparable to similar non-GAAP presentations used by other companies. We believe that presenting our assets on this basis is meaningful because it is consistent with the way management views and manages risks associated with our assets and better enables an assessment of the liquidity of our assets. See Supplementary Information SI 10 for a reconciliation of this allocation to our U.S. GAAP balance sheet.

² Excludes Level 3 assets, Other assets, Investments in funds at Net Asset Value and certain loans receivable.

“Global Core Liquid Assets” or “GCLA”) or similarly liquid assets, including assets that have been segregated for the exclusive benefit of our customers.

- Our ICS business segment accounts for a further third of our balance sheet. The inventory of financial instruments within the ICS segment is used to facilitate the execution of client transactions across multiple products, markets and geographies in our role as market maker.

On the liability side of our balance sheet, we maintain significant tenor in both our secured and unsecured borrowings, thereby reducing the likelihood that liquidity shortfalls triggered by maturing funding transactions would compel us to resort to disorderly sales of our securities inventory. The chart below shows that we also maintain diversification of our funding sources:



Core Business Lines

Consistent with prior resolution plans, we have performed an analysis to identify the businesses that should be considered “core business lines,” which are defined as those businesses (including their associated operations, services and support functions) that would result in a material loss to the firm of revenue, profit or franchise value in the event of their failure.

Using the same measurement criteria and thresholds as in prior years, our analysis considered each of the firm’s business units’ average contribution over the last three years to the firm’s pre-tax net revenues and net earnings. This quantitative analysis was augmented by qualitative analyses, including an assessment of the franchise and synergy value of each business. As a result of this

process, we concluded that no change is warranted in our core business lines, which remain IBD and ICS.

Material Entities

After we had identified our core business lines, we performed an analysis to identify the operating and service entities that are significant to the maintenance of such activities and are therefore designated as either material operating entities or material service entities.

As a result of our analysis, we concluded that we have eight material operating entities and nine material service entities; in addition, our “covered company” is the parent company of the firm, Group Inc. The only change since our 2017 submission is the de-classification of one entity that no longer meets the criteria for being considered a material entity.

3. Preferred Resolution Strategy

We recognize that actual events rarely unfold exactly as expected. Throughout the preparation of our Resolution Plan, we have emphasized the need for flexibility to deal with a wide variety of real-world situations, and have focused as much on the planning process as on the creation of a plan to address a specific situation. Our preferred resolution strategy is consistent with a single point of entry strategy:

- We assume a period of financial difficulties, followed by an extremely large financial loss and significant outflows of liquidity.
- This causes our parent company and one smaller material operating entity, J. Aron & Company LLC (JANY), to enter bankruptcy proceedings.
- Most material operating entities and all material service entities survive for long enough to be wound down in an orderly manner over an extended period, either because they already have sufficient pre-positioned capital and liquidity at their disposal, or because they are material entities that are parties to the CLSA (see page 19) (participating material entities) and, as such, are contractually entitled to receive financial resources from Funding IHC.
- Our material service entities continue to provide operational services to the participating material operating entities because they are contractually obligated to do so and would continue to be paid for providing those services.
- By keeping the participating material operating and service entities out of proceedings, we can facilitate the gradual and orderly wind-down of our balance sheet, and thereby avoid the disruption that could be caused by a sudden cessation of activities. This strategy avoids the fire-sale of assets, minimizes unnecessary losses and permits the orderly transfer of client accounts to alternative service providers.

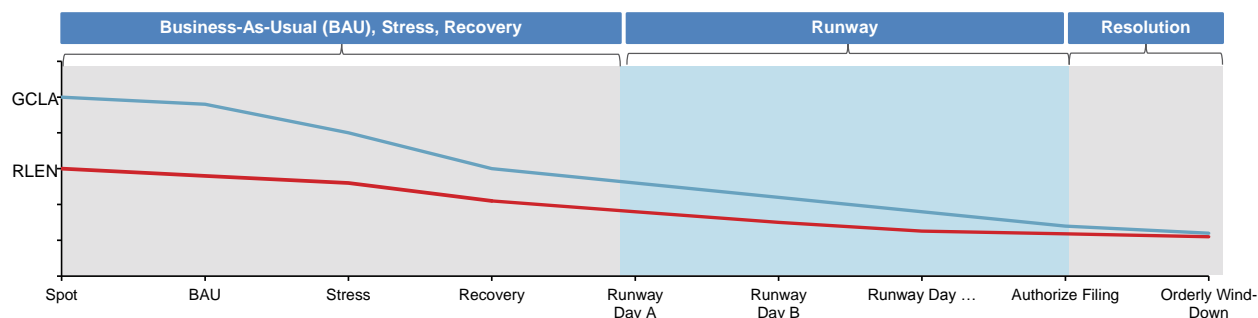
The table below summarizes the anticipated resolution approach for Group Inc. and each of our material operating entities:

| Resolution Approach For Material Operating Entities | | | |
|--|-----------------------|--|---|
| Material Operating Entity | Potential Sale | Orderly Wind-down Outside of Bankruptcy Proceedings | Supervised Orderly Wind-down in Bankruptcy Proceedings |
| The Goldman Sachs Group, Inc. | x | x | ✓ |
| Goldman Sachs & Co. LLC | x | ✓ | x |
| Goldman Sachs International | x | ✓ | x |
| Goldman Sachs Bank USA | x | ✓ | x |
| J. Aron & Company LLC | x | x | ✓ ¹ |
| Goldman Sachs Japan Co., Ltd | x | ✓ | x |
| Goldman Sachs International Bank | x | ✓ | x |
| Goldman Sachs Asset Management, L.P. | ✓ | x | x |
| Goldman Sachs Asset Management Int'l | ✓ | x | x |

Note 1. Our preferred resolution strategy reflects an orderly wind-down in proceedings, although alternative options are available.

We have established a series of quantitative “triggers and alerts” that are based on the firm’s most important capital and liquidity metrics. The triggers and alerts serve as indicators of the firm’s financial health: alerts are less severe than triggers and are intended to signal that the firm may need to take action to avoid further financial stress that would breach a trigger; triggers, on the other hand, may cause the firm to enter the runway and begin preparations for a bankruptcy filing.

The chart below uses liquidity metrics³ to illustrate how, based on these triggers, decreasing levels of GCLA would cause the firm to enter a recovery period, then the runway, and finally resolution:



We have prepared detailed projections of the firm’s capital and liquidity positions over an 18-month wind-down period under our preferred resolution strategy. Our forecasts show that, with their pre-positioned capital and liquidity resources, together with any further infusions of capital or liquidity from Funding IHC, our participating material operating entities have sufficient resources to repay all their creditors and wind down in an orderly manner over the forecast period. After wind-down, all residual value is returned to Group Inc. and is distributed to Group Inc.’s stakeholders.

At the conclusion of the resolution process, only a small number of discrete businesses may have survived and been sold to third parties. Most of our other assets would have been sold or wound down, and remaining assets are comprised primarily of loans and cash or cash-equivalents. Approximately 18 months after Group Inc.’s bankruptcy filing, participating material entities have all been wound down or sold, and any residual value is returned to Group Inc. to be distributed to Group Inc.’s stakeholders.

We recognize that events could unfold in a different manner from that envisioned in our preferred resolution strategy, necessitating a different distribution of capital and liquidity to support a subsequent unwind. Our financial models are designed to be sufficiently flexible to adapt to actual stressed conditions, so as to enable filing decisions at the appropriate time and allow the firm to be resolved in an orderly manner under those circumstances. Depending on the severity of these alternative circumstances, it is possible that several (or all) of our material entities would enter bankruptcy, insolvency or similar proceedings. These proceedings could include: FDIC receivership for GS Bank, liquidation under the Securities Investor Protection Act for our U.S. broker-dealer; and relevant bankruptcy proceedings in the United Kingdom and Japan.

³ Capital metrics also function in the same manner.

4. Resolution-Critical Capabilities

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A. Introduction To Our Resolution Capabilities

We have built all of the underlying capabilities that we believe are required to support the successful execution of our preferred resolution strategy, and to support flexibility in that strategy. As we developed these capabilities, we took particular care to incorporate them into our business-as-usual practices, including our governance practices and our operational policies and procedures. We paid particular attention to the 2019 Guidance, which is intended to help firms develop their preferred resolution strategies.

The following high-level summary of the capabilities that we have developed is organized in the same order as the topics in the 2019 Guidance.

B. Capital

In order to execute our preferred resolution strategy, our parent company must have enough loss-absorbing capacity (i.e., external TLAC) to recapitalize our participating material entities so they could continue to operate while the parent company is in bankruptcy. In deciding how to allocate loss-absorbing capacity among participating material entities (i.e., internal TLAC), it is also important to balance the certainty associated with pre-positioning against the flexibility of holding recapitalization resources centrally, either at the parent company or at our Funding IHC, to meet losses or liquidity outflows wherever they are incurred.

TLAC

GS Group is subject to the Federal Reserve's TLAC rules, which went into effect in January 2019. The table below demonstrates that our TLAC ratios are well in excess of these requirements:

| External TLAC Ratios at December 31, 2018 | | | |
|---|------------------------------------|--------------------|------------------------------------|
| | Actual (\$ in billions) | Requirement | Excess (\$ in billions) |
| Components: | | | |
| TLAC | \$ 254.8 | | |
| External Long-Term Debt | \$ 160.5 | | |
| Risk-Weighted Assets (RWAs) | \$ 558.1 | | |
| Leverage Exposure | \$1,342.9 | | |
| Ratios: | | | |
| TLAC / RWAs | 45.7% | 22% | \$ 132.1 |
| TLAC / Leverage Exposure | 19.0% | 9.5% | \$ 127.3 |
| External Long-Term Debt / RWAs | 28.8% | 8.5% | \$ 113.1 |
| External Long-Term Debt / Total Leverage Exposure | 12.0% | 4.5% | \$ 100.1 |

Group Inc. is also in compliance with the “clean HoldCo” elements of the Federal Reserve’s TLAC rules, which prohibit it from engaging in certain practices, including:

- Issuing short-term debt (i.e., debt with an initial maturity of less than one year);
- Entering into “qualified financial contracts”⁴ with third parties⁵;
- Entering into contracts that give the third party a right to offset the debt it owes to a GS Group affiliate against an amount owed to it by Group Inc.;

⁴ As defined in 12 U.S.C. 5390(c)(8)(D).

⁵ Other than a credit enhancement, such as a parent guarantee of a subsidiary’s qualified financial contract, and other limited exceptions.

- Guaranteeing the liabilities of subsidiaries if such a guarantee would permit the exercise of default rights against the subsidiary in the event of Group Inc.'s insolvency;
- Benefitting from "upstream" guarantees of Group Inc.'s liabilities by affiliates; and
- Incurring non-contingent unsecured liabilities to third parties that do not count as TLAC in excess of 5% of total liabilities.

Internal TLAC

Internal TLAC is subject to local requirements in certain jurisdictions. For example, the Bank of England's internal MREL⁶ requirements began to phase in from January 2019, and the European Union is expected to introduce its own requirements in the near future. The MREL requirements apply to GSI (our UK broker-dealer) and to the holding company of the UK regulated group, both of which are in compliance with the new requirements.

Resolution Capital Adequacy and Positioning (RCAP)

In addition to the requirements outlined above, which address the loss-absorbing capacity we must have at our parent entity (Group Inc.), our UK holding company (GSG UK), and our UK broker dealer (GSI), we have developed an RCAP framework designed to ensure that:

- Group Inc. maintains enough external TLAC to allow Funding IHC to recapitalize participating material entities so that they continue to meet their regulatory and operational needs while they wind down outside of proceedings over an extended period.
- Internal TLAC is positioned in a manner that appropriately balances the certainty associated with pre-positioning directly at participating material entities with the flexibility of holding recapitalization resources centrally to meet unanticipated losses wherever they may occur.

The key components of our RCAP framework (each of which is discussed in more detail below) are:

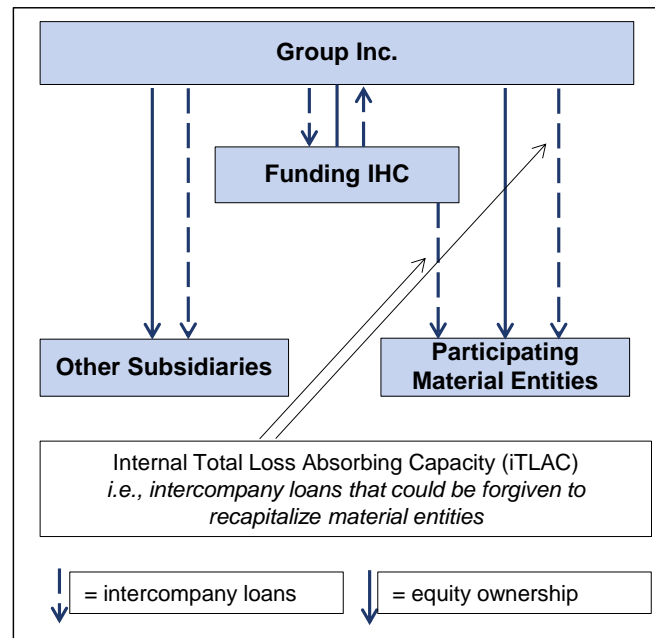
- Our Funding IHC;
- Our Capital and Liquidity Support Agreement;
- Our calculations of Regulatory Capital Execution Need (RCEN); and
- Our triggers and alerts framework.

Our Funding IHC

Our Funding IHC is a direct, wholly-owned subsidiary of Group Inc. This entity is fundamental to our pre-positioning strategy, and has been designated as a material service entity. In business-as-usual conditions, it provides most of the overnight and term loans required by our participating material entities and our parent company, and holds most of the firm's excess liquidity that is not already pre-positioned at participating material operating entities.

⁶ MREL stands for Minimum Requirements for own funds and External Liabilities.

The chart below illustrates the role of Funding IHC:



Capital and Liquidity Support Agreement (CLSA)

The CLSA is a contractually binding mechanism to which Group Inc., Funding IHC, our participating material operating entities and all of our material service entities are parties. If pre-determined capital or liquidity triggers are breached, the CLSA requires Group Inc. to transfer additional resources to Funding IHC, and also requires Funding IHC to provide financial support to participating material entities. This support begins during the runway and continues for an indefinite time after Group Inc.’s bankruptcy filing, until the resolution liquidity and capital needs of the participating material entities are satisfied. Group Inc. and Funding IHC have granted a security interest in substantially all of their assets (other than Group Inc.’s equity interests in subsidiaries) to secure their obligations under the CLSA.

The CLSA and Funding IHC bring two main benefits to our resolution strategy. First, they provide greater assurance that capital and liquidity will be dispensed as needed to the participating material entities. Second, they introduce a higher degree of flexibility because Funding IHC does not enter resolution proceedings in our preferred resolution strategy, and the exact amount and location of capital and liquidity therefore does not need to be pre-determined.

The CLSA operates as follows:

- during the runway, the CLSA requires Funding IHC to provide liquidity and recapitalize participating material entities as and when needed, including by forgiving or converting

intercompany debt or injecting capital, so that they meet their applicable regulatory capital requirements plus an operating buffer⁷;

- if the resolution trigger under the CLSA is breached, it requires Group Inc. to make a final contribution to Funding IHC of almost all remaining GCLA held by Group Inc.⁸, as well as intercompany receivables held by Group Inc.;
- following Group Inc.'s bankruptcy filing, the CLSA requires Funding IHC to continue providing liquidity and recapitalizing participating material entities as before.

RCEN Calculations

We calculate and monitor RCEN on a regular basis for each of our participating material operating entities. An entity's RCEN is the cumulative amount of capital it would need in order to wind itself down in an orderly manner over time, following our parent company's bankruptcy. In order to calculate a material entity's RCEN, it is first necessary to project its capital requirements over the wind-down period, taking into account its projected expenses⁹ and the gradual wind-down of its balance sheet. At each projection point, we measure a capital "excess" or "shortfall" (i.e., the difference between the projected regulatory capital levels and the amount required to meet the entity's applicable regulatory requirements).

For each participating material entity, RCEN is:

- the amount of capital it held at the start of the projection period
- plus the largest projected shortfall (or less the smallest projected excess)

Our calculations are based on a series of financial models that have been fully documented in accordance with our internal model governance framework and validated by our Model Risk Management group. They assume a highly stressed environment for the projected liquidation of inventory.

In a resolution scenario, a material entity's RCAP requirement is the sum of its RCEN, its share of the initial loss, and its runway losses. If an entity has prepositioned internal TLAC in excess of its RCAP requirement, it does not require additional capital resources in order to execute an orderly wind-down in line with our preferred strategy.

⁷ For the purpose of the CLSA, Funding IHC is required to ensure that each participating material entity meets or exceeds its applicable regulatory capital requirements (for example, GS Bank should meet the "well capitalized" standard under the Prompt Corrective Action framework).

⁸ Under the terms of the CLSA, the final contribution of remaining GCLA excludes an amount held back to fund the projected administrative expenses of Group Inc.'s bankruptcy proceeding and the projected amount of Group Inc.'s cash disbursements through the next business day.

⁹ Projected expenses include operating expenses, bid / offer costs on the sale of cash inventory and derivative exit costs.

Triggers and Alerts Framework

We have established a series of quantitative “triggers and alerts” that are based on the firm’s most important capital metrics¹⁰, which we calculate on a daily basis. These triggers and alerts serve as indicators of the firm’s financial health: alerts are less severe than triggers and are intended to signal that the firm may need to take action to avoid further financial stress that would breach a trigger; triggers, on the other hand, may cause the firm either to enter the runway or to commence preparations for a bankruptcy filing. Our resolution triggers and alerts framework is outlined in the playbook for our Board, and has been incorporated into our existing triggers and alerts framework.

¹⁰ *The triggers and alerts framework also includes liquidity metrics, which are discussed later in this document.*

C. Liquidity

Overview of Liquidity Risk Management

Our liquidity risk management framework is designed to ensure that we maintain sufficient liquidity to fund our business activity and meet our contractual and contingent obligations in both normal times and during periods of stress. We manage our liquidity levels to several internal and regulatory stress requirements, including:

- Modeled Liquidity Outflow (MLO): A measure of contractual and contingent outflows over a severely adverse 30-day period, based on multiple scenarios that include combinations of market-wide and firm-specific stress events.
- Intraday Liquidity Model (ILM): A measure of intraday liquidity requirements during a scenario in which access to sources of intraday liquidity become constrained.
- Long-term Stress Test (LTST): A forward view on liquidity through a prolonged period during which we experience a severe liquidity stress and recover in an environment that continues to be challenging.
- Liquidity Coverage Ratio (LCR): A regulatory rule that requires firms such as Goldman Sachs to maintain an adequate ratio of eligible high-quality liquid assets (HQLA) to expected net cash outflows under an acute, short-term liquidity stress scenario.

These liquidity risk management capabilities are supplemented by our Resolution Liquidity Adequacy and Positioning (RLAP) and Resolution Liquidity Execution Need (RLEN) frameworks (described below), which we developed as part of our resolution planning efforts.

We seek to hold GCLA in the form of unencumbered, highly liquid securities and cash, in sufficient quantity to meet all of the liquidity risk requirements described above, taking into account constraints that apply at both the consolidated and subsidiary levels.

RLAP Framework

Our RLAP framework is designed to ensure that we hold sufficient liquidity at the parent company and Funding IHC to cover projected liquidity deficits at material entities over a 30-day stress period.

On a daily basis, we estimate the projected stand-alone liquidity position of each of our material operating entities over such a stress period (RLAP requirement). This estimate is largely based on the same assumptions as our MLO and ILM liquidity stress tests, but treats inter-affiliate exposures in the same manner as third-party exposures. It takes into account such factors as mismatches between contractual inflows and outflows, intraday liquidity needs, inter-affiliate frictions, and the effect of actions that might be taken by clients, counterparties, Financial Market Utilities (FMUs) or regulatory authorities.

In order to balance the flexibility of holding resources at the parent company or Funding IHC against the certainty of pre-positioning, our participating material operating entities hold GCLA in an amount equal to a portion of their RLAP requirements, and the remainder is held by Group Inc. and Funding IHC. The amount held by each entity varies according to its size and complexity.

In determining whether we have sufficient liquidity at the parent company or Funding IHC, we make the assumption that a projected liquidity surplus at one material operating entity cannot be used to meet a liquidity deficit at another material operating entity, or to augment the resources of either our parent company or Funding IHC. We hold a buffer above the minimum requirements that can be deployed to meet unanticipated events. RLAP is incorporated into our triggers and alerts framework as a signal of stress or entry into the recovery period.

RLEN Framework

RLEN is an estimate of the liquidity that each participating material operating entity requires in order to stabilize itself and operate post-filing in support of our resolution strategy. It is comprised of minimum operating liquidity (MOL) and peak funding need (PFN):

- MOL is a measure of the liquidity needed at each entity to continue operating post-filing, taking account of intraday requirements, operating expenses and working capital needs.
- PFN is the peak level of cumulative net outflows during the stabilization period, based on daily cash flow forecasts by entity, taking into account the effect of inter-affiliate transactions. These outflows include contractual outflows, contingent outflows from adverse client and counterparty actions, and the impact of unwinding our businesses.

RLEN is incorporated into our triggers and alerts framework. Our triggers are calibrated at levels designed to ensure that resolution would be considered at a time when the firm still has sufficient liquidity to conduct an orderly wind-down.

We recognize that events could unfold in a different manner from that envisioned in our preferred resolution strategy. Accordingly, we have the capabilities to adapt our RLEN model so that it can reflect actual stress conditions and provide a meaningful safeguard against “false positive” resolution triggers.

D. Governance Mechanisms

Playbooks and Triggers

We believe that advance preparation is necessary to ensure that our processes and people are able to respond quickly and appropriately to a deteriorating financial situation. To that end, we have prepared a series of playbooks to enable our Board, the boards of our other material entities, and senior management to make well-considered decisions and take appropriate actions across functional departments and legal entities, especially during the runway period.

We have also prepared an employee retention plan to enable us to move swiftly to retain those employees who are critical to our resolution strategy. In addition, we have prepared a communication strategy to facilitate the timely provision of information to regulators, staff, clients and other stakeholders in a resolution scenario; and we have prepared playbooks that outline how cross-jurisdictional intercompany shared services could be maintained in a resolution scenario.

Where appropriate, our playbooks incorporate triggers, based on capital and liquidity metrics, that are linked to specific actions as the firm transitions from business-as-usual conditions to a stress or recovery period, then to a runway period, and finally to a resolution period.

E. Operational

Payment, Clearing, and Settlement Activities

In order to avoid jeopardizing the stability of the financial markets during a resolution event, it is essential for our clients and material operating entities to have ongoing access to critical PCS activities. Accordingly, subject matter experts within our firm performed a quantitative and qualitative evaluation to identify which FMUs (i.e., clearing counterparties, central securities depositories, agent banks, and payment messaging systems) are critical to the successful execution of our preferred resolution strategy. As a result of this process, we identified 22 critical FMUs, which are listed in Supporting Information Section 5 on page 88.

We also established a methodology for identifying key clients using criteria such as the value and volume of transactions, and the size of lines of credit, as well as other qualitative criteria. Our methodology and mapping to FMUs and core business lines have been documented and presented in a new “Key Client Playbook,” which also documents the range of contingency arrangements that the firm would consider, including the viability of transferring client transactions and assets to third parties or of making alternative arrangements to allow key clients continued access to critical PCS services.

We understand the importance of communicating with clients, and we have developed, documented and implemented a communication strategy for notifying key clients about relevant aspects of our resolution planning efforts and educating them on the potential impact of our resolution strategy on their businesses in various ways and at different points in time.

Managing, Identifying, and Valuing Collateral

Our systems and processes for managing securities collateral are fully compliant with, and in several respects go well beyond, the supervisory expectations in the applicable regulatory guidance. Each of our material entities has the capability to identify and value the specific securities that it has pledged and received as collateral, and to identify for each such security:

- the counterparty (including affiliated entities and central counterparties);
- the institution that holds the collateral;
- the jurisdiction in which collateral is located; and
- the jurisdiction in which the security interest in the collateral is enforceable.

Based on this information, our systems are able to assess the enforceability, segregation and rehypothecation status of each piece of pledged and received collateral. They are able to do so in a timely manner (generally on the day after trade-date), even against the backdrop of significant spikes in volume during a period of stress.

We have put in place a comprehensive collateral management policy that outlines our approach to collateral management and serves as a single source for governance. We have also invested in a technology platform that contains all of our qualified financial contracts and required metadata, for all of our legal entities, in a searchable format and on a single platform. This platform gives us the ability to query and produce aggregate statistics on collateral-related contract terms, such as

cross-default clauses and downgrade triggers, for all qualified financial contracts across contract types, business lines, legal entities and jurisdictions.

Management Information Systems

Our firm has a long history of investing significantly in technology, and our management information systems are designed to provide complete, timely and accurate information across our firm. Our commitment to technology platforms has enabled an agile and innovative approach to our recovery and resolution planning initiatives.

We have carefully analyzed the data, information, systems and reporting required to support our resolution plan and are confident we have the capability to produce the material information required to support the operational execution of our resolution strategies across material entities and core business lines.

To support our risk management function, we use a single platform (SecDB) across the majority of the firm's assets, and we compute risks driven by changes in market factors, counterparty risk, liquidity risk and operational risk.

Our Critical Report Catalog details approximately 140 resolution-critical reports that we have identified as necessary in a resolution scenario, including the data required for bankruptcy filing. The reports are housed in the firm's Regulatory Obligation Database, which serves as a central repository for the firm's regulatory reporting obligations.

Recognizing the importance of preparedness, we took steps in early 2019 to revalidate the ownership of the information and reports required for a potential bankruptcy filing, pulled sample data and documentation to validate our capabilities, and archived the evidence for reference.

We continue to invest in our core resolution MIS capabilities, including the firm's data visualization platform (Recovery and Resolution Visualizer), which navigates several of the firm's production data stores and leverages intelligent matching and modeling techniques to visualize key interdependencies and relationships. This dynamic technology tool would be invaluable in a resolution scenario because it provides the ability to analyze and explore legal entities, entity owners, inter-entity relationships, and other dimensions of operational continuity. The Recovery and Resolution Visualizer links to many of the firm's key data sources, including Pickwick, our strategic "document lake" which houses the firm's key legal agreements, including qualified financial contracts, critical leases, and third-party vendor agreements.

Shared and Outsourced Services

We have developed a comprehensive framework that is designed to ensure the operational continuity of resolution-critical shared services in the event of a bankruptcy of Group Inc. The cornerstones of this framework are as follows:

- (a) Shared Services Governance: The Shared Services Working Group, supported by a Shared Services Management Office, reports to the Recovery and Resolution Steering Group and is

responsible for developing a global strategy for shared services and ensuring that it is consistently executed across all regions.

- (b) Service Entity Strategy: Our global strategy for service entities is designed to provide for flexible operational continuity capabilities. The primary feature of this strategy is that a high proportion of the staff and assets supporting multiple operating entities should be employed or owned by a service entity. We have several such service entities: they are organized under short, simple ownership lines, and they are operationally and financially resilient because they have their own operational and governance infrastructure, and they maintain six months' worth of working capital on hand as a buffer in case payments for services are not timely received.
- (c) Contractual and Operational Arrangements: Both of our service entities and resolution-critical external vendors are contractually obligated, even after a bankruptcy filing by our parent company, to continue providing services to material operating entities that continue to pay for such services. Intercompany legal agreements give material entities continued access to intellectual property, information technology and physical office facilities in a resolution scenario.

In addition, all resolution-critical intercompany services across the firm are documented in service-level agreements based on arm's length prices, linked to core business lines, and recorded in a data repository and workflow management application (SLATE) that stores the underlying documents and facilitates coordination between entities that receive and provide inter-affiliate services. Essential staff functions have also been identified and options designed to ensure the retention of the relevant employees have been developed.

We have also created a series of playbooks describing arrangements to prevent the loss of access to employees, vendors, technology, intellectual property or facilities in the event that any of our subsidiaries providing resolution-critical intercompany services enters into bankruptcy proceedings.

Since our 2017 submission, we have continued to improve the operational efficiency of our shared and outsourced service management through increased automation, and have embedded our processes more firmly into our business-as-usual practices. Key highlights include the following:

- We transferred the Shared Services Management Office into the Services Division and merged it with the Vendor Management Office, which has historically managed our relationship with external vendors. The objective was to embed resolution-related considerations into day-to-day processes and centralize the management of both shared services and outsourcing relationships.
- We strengthened our governance arrangements by extending the oversight of the Global Business Resilience Committee (which is now the Global Business and Operational Resilience Committee) to include shared and outsourced services. Our enhanced governance processes are supported by:
 - an updated policy (the “Interaffiliate Services Policy”) and procedures documentation in support of our shared services management practices; and

- quarterly reporting to senior management on metrics and exception tracking to monitor compliance with shared services criteria.
- We enhanced the content of our service level agreements (SLAs) by adding key performance indicators and standards of performance.
- We have continued to manage our population of SLAs by undertaking a review of the criticality and materiality of SLAs with program stakeholders, resulting in a one-third decrease in the number of SLAs (from approximately nine thousand to six thousand).
- We refined and formalized the definition of ‘outsourcing’ for the intercompany program.
- We made further improvements to our technology infrastructure. Specifically, we enhanced the SLATE workflow processes to increase efficiency and facilitate on-boarding of new services, and we further enhanced our technology system’s query capacity and reporting functionality.

Legal Obstacles Associated with Financial Support and Emergency Motions

Creditor Challenge: The provision of financial support to participating material operating entities is a critical component of our preferred resolution strategy because it allows these entities to avoid potential resolution proceedings themselves. However, we recognize the risk that a legal challenge by the creditors of Group Inc. could potentially hinder the provision of such financial support, and we have taken a number of steps to reduce the likelihood that such a challenge would be successful:

- With the help of external counsel, we have prepared an analysis that identifies potential obstacles under state and bankruptcy law to the provision of financial support. This analysis includes a consideration of potential creditor challenges based on claims of fraudulent transfer, preference, breach of fiduciary duty, breach of indenture covenants and equitable claims to enjoin the provision of financial support. The analysis considers potential obstacles to each element of the planned financial support, the timing considerations implicated by potential claims, and the extent to which any adjudication could affect the execution of our preferred resolution strategy.
- We established a Funding IHC as a direct subsidiary of Group Inc. In business-as-usual conditions, it provides most of the overnight and term loans required by our participating material entities and the parent company, and holds much of the firm’s excess liquidity that is not pre-positioned at participating material entities. Importantly, Funding IHC has no external creditors and it does not enter proceedings under our preferred resolution strategy. Funding IHC reduces the need for Group Inc. to contribute significant assets to material entities during the preference period that would precede its bankruptcy filing. *See page 18 for an overview of the role of Funding IHC.*
- We have put in place a CLSA to which Group Inc., Funding IHC, participating material operating entities, all of our material service entities and certain intermediate holding companies are parties. If pre-determined capital or liquidity triggers are breached, the CLSA requires Group Inc. to transfer additional resources to Funding IHC, and Funding IHC to provide financial support to participating material operating entities. Group Inc. and Funding

IHC have granted a security interest in substantially all of their assets (except Group Inc.'s equity interests in subsidiaries) to secure their obligations under the CLSA.

The CLSA provides additional protection against creditor challenge because the decisions to contribute Group Inc. assets, tie Funding IHC's support of participating material entities to specific metrics, and secure those obligations of Group Inc. and Funding IHC with collateral, were each taken when Group Inc. was solvent and had not entered the preference period that precedes a bankruptcy filing. See *page 19 for a more detailed discussion of the CLSA*.

First-Day Issues: We have prepared an analysis of issues that are likely to be raised at the hearing on the first-day emergency relief motion¹¹ and the best arguments in support of the motion. Issues that we have considered include, among others, possible assertions by creditors that they had insufficient opportunity to respond to the emergency motion, given that a creditors' committee is unlikely to have been appointed by this time. Because our preferred resolution strategy assumes that the parent company would seek to remain obligated on its guarantees, our analysis considers the legal basis upon which it would do so, the ability of the bankruptcy court to prevent third parties from interfering with the parent company or its subsidiaries in bankruptcy, and the interplay of public policy concerns (such as the need to preserve financial stability) with the bankruptcy court's decisions. Our analysis also considers the alternative request to transfer assets and certain credit enhancements to a trust-owned, newly-formed entity.

Regulatory Implications: We have discussed our preferred resolution strategy with key regulatory authorities globally, and have worked with outside counsel to consider the steps the firm could take to provide key domestic and foreign authorities with the necessary assurances to avoid objection to the emergency motion.

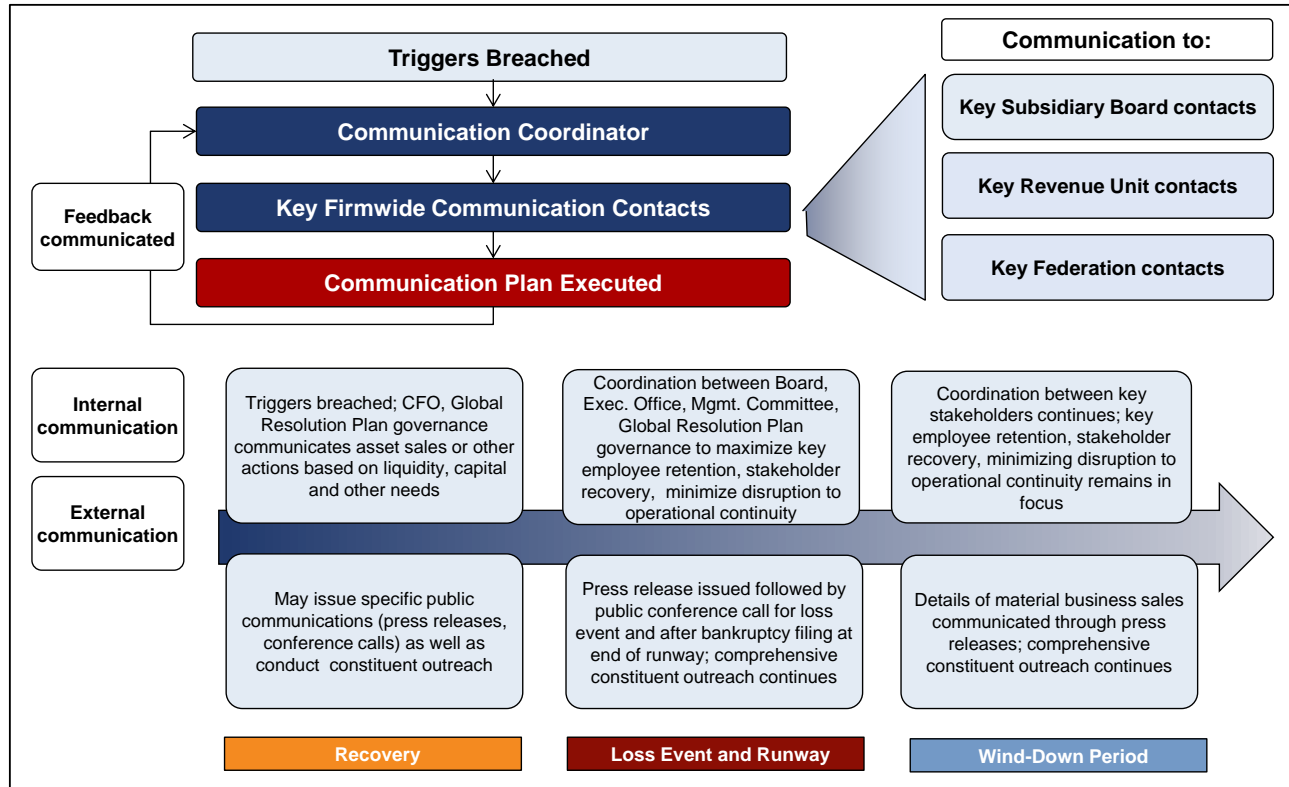
Format: Our "Bankruptcy Playbook" that we have prepared includes a sample emergency motion and first day motions substantially in the form they would be presented to the bankruptcy court.

¹¹ This is the hearing at which an entity in Chapter 11 proceedings seeks court approval of an order to stay all contracts under the ISDA Resolution Stay Protocols or a bilateral agreement, subject to the condition either that the claims are elevated to administrative priority status or that the contracts are transferred to a bankruptcy bridge company.

Communication Strategy

Timely communication, both internally and externally, is vital for a successful resolution plan. Though there are many factors at play during a resolution scenario, we have a comprehensive and carefully crafted communication strategy in place as part of our Resolution Plan.

Please refer to the diagram below for a summary of our communication flow:



F. Legal Entity Rationalization and Separability:

Legal Entity Rationalization

By the time of our last resolution plan submission in 2017, we had already fundamentally transformed the corporate structure of our firm. Specifically, under the oversight of the Legal Entity and Booking Model working group (LEWG)¹², we had brought our corporate structure into line with newly-established criteria for a more rational, less complex organization. This resulted in a simple ownership structure for all of our material operating and service entities, and logical groupings of other entities under holding companies that enhance our ability to sell discrete businesses such as GSAM, MBD and SSG.

Since 2017, our focus has been on embedding our legal entity rationalization criteria into business-as-usual processes, and continuing to enhance the governance framework for legal entities and booking models. All new legal entities, significant entity restructurings, and booking model changes must be now approved by the LEWG. Proposals that are inconsistent with our criteria are identified at an early point in the process and, if significant to our resolution strategy, are rectified before implementation; if they are not deemed significant to our resolution strategy, they are nevertheless documented, approved and tracked by the LEWG to ensure they are managed appropriately.

The LEWG also performs periodic reviews, such as a benchmark review of operating entities to the criteria for a more rational, less complex organization, or a review of “In-the-Box” structures, with the goal of ensuring that control of the firm’s corporate structure is maintained. The governance framework is supported by the firmwide Legal Entity and Booking Model Policy, which was expanded in 2018 to cover all aspects of an entity’s lifecycle and to incorporate requirements in respect of transaction booking models.

LEWG oversight of our legal entity structure is facilitated by the Recovery and Resolution Visualizer, our data visualization platform (described in the Management Information Systems section on page 26), which presents information about the firm’s legal entities in a clear, visual format. Recent enhancements to this platform include improved visualization, filtering and search capabilities.

Separability

We undertook a project to address the shortcoming identified by the Agencies concerning the separability of our businesses or asset groups to be sold, and specifically our analysis of the actionability of these divestiture options in our 2017 Resolution Plan. We recognize the significance of the Agencies’ finding because we understand the importance of the additional optionality that such sales might offer, and the need to be prepared to execute them if they are selected.

¹² Formerly, the Legal Entity Structure and Strategy working group.

In order to address this shortcoming, we reviewed our process for the identification and selection of divestiture options to ensure that it is repeatable and appropriately documented. Then, with the assistance of our internal Firmwide Strategy group, we reviewed all of the firm's businesses to identify assets, portfolios, business lines or legal entities that might realistically be sold in the context of a resolution scenario. We engaged with individual business lines in order to:

- Analyze the separability attributes of each divestiture option in a consistent manner using standardized templates;
- Document potential impediments to separability across a range of operational, financial, and legal factors;
- Map each identified impediment to specific mitigating strategies, differentiating between existing capabilities that address potential impediments or actions that could be undertaken during execution of the divestiture option;
- Identify potential buyers, strategies to transfer objects of sale to buyers, potential impediments to those strategies, and mitigating actions;
- Enhance the documentation of assumptions and procedures for valuing each divestiture option to determine the range of financial benefits that could realistically be expected under conditions similar to the firm's capital stress analysis;
- Determine what information would be needed by prospective buyers and develop the capability to populate a data room in a timely manner; and
- Revise our existing "object of sale playbooks" so that each follows a consistent outline, with an expanded discussion of the governance over execution, and develop standard templates (e.g., transitional service agreement) in case required.

We found that, although the ability of our core business lines to adapt quickly to changing circumstances is a fundamental strength of our de-risking and de-levering capabilities, this somewhat limits the available number of discrete divestiture options because it is likely that such businesses would shrink significantly in a stress scenario and alternative service providers would quickly step in to take their place. Furthermore, we have sold several businesses in the last five years, and although this has given us additional experience in managing such sales, it has also reduced the number of potential divestiture opportunities.

Nevertheless, we found that some of the firm's discrete operations and portfolios do lend themselves to being sold and, in certain circumstances, this may generate greater financial benefits than alternative strategies. As a result of our analysis, we selected six businesses as divestiture options, two of which were new in our 2019 Plan.

G. Derivatives and Trading Activities:

Introduction

Consistent with our role as a global investment banking and securities firm, Goldman Sachs has a large portfolio of derivatives. In previous iterations of our resolution plan, we had already devoted substantial resources to analyze the wind-down of our derivative positions. However, the 2019 Guidance introduced new requirements for inter-affiliate risk monitoring, a description of the booking model framework, and an analysis of our ability to perform portfolio segmentation and forecasting. We believe that we have fully addressed these new requirements.

Although our derivatives portfolio is large, our ability to wind it down in a resolution scenario is greatly aided by the fact that most of our derivatives positions are held in just three subsidiaries, all of which are material operating entities that would, in a resolution scenario, receive financial support from Funding IHC if needed, and would therefore be wound down in an orderly manner over an extended period of time.

The discussion (below) of our derivatives and trading activities follows the order of the topics laid out in the 2019 Guidance.

Booking Practices

Derivatives Booking Framework:

We have a derivatives booking framework comprised of the policies, principles, rationale and approach to implementing our derivative booking practices. The purpose of the framework is to ensure that transactions are booked in a manner that facilitates business-as-usual practices without impairing the resolvability of the firm. Our framework is underpinned by methodical booking practices that are consistently applied to external and inter-affiliate transactions across legal entities, trading desks and products.

Derivative entity analysis and reporting

We have the ability to provide highly granular reporting for each of our entities with derivatives portfolios. This allows us to evaluate the significance of each material derivatives entity with respect to the firm's current activity and preferred wind-down strategy.

A significant portion of inter-affiliate transactions arises because of our business-as-usual practice of centralizing market risk by product or inventory category in a small number of material operating entities: when the client-facing entity is not also the market risk-managing entity, each transaction with a client generates an additional intercompany transaction to transfer the risk to the risk management entity. This practice has numerous benefits from a business-as-usual risk management perspective: in particular, it maximizes the internal netting of market risk exposures, which results in fewer external hedging transactions with the market.

We have taken several steps to mitigate the increased interconnectivity resulting from intercompany derivative transactions:

- Because all affiliates that engage in external derivatives activity under ISDA Master Agreements have signed the 2015 and 2018 ISDA Resolution Stay Protocols (ISDA Resolution Stay Protocols), their derivatives with adhering counterparties (including all intercompany derivatives) are subject to a stay on certain cross-default and early termination rights in standard ISDA derivative, repo and securities lending contracts in the event of resolution.
- We have taken steps to move counterparties to face the risk management entity, where possible.
- By establishing central clearing arrangements between material operating entities, a large percentage of our intercompany derivative transactions are now centrally cleared and no longer present “interconnectedness risk.”
- Where possible, we continue to compress derivative contracts, including inter-affiliate contracts, for example through mutually agreed “tear-ups,” coupon blending and risk free netting.

Inter-Affiliate Risk Monitoring and Controls

Our systems for the monitoring and control of inter-affiliate risk have been designed and built to offer all of the measurement, monitoring, analysis, and reporting capabilities available for the management of counterparty risk. We recognize that inter-affiliate risk differs from counterparty risk in that the financial distress of an affiliate, particularly of a material entity, poses distinct risk management challenges because it is likely to be accompanied by financial and operational challenges for the firm as a whole. We supplement our usual counterparty risk management practices by monitoring and reporting metrics, such as the cost and effectiveness of our re-hedging strategy for material entities, that are of specific importance to inter-affiliate risk management.

Derivative Stabilization and De-Risking Strategy

The ability to wind down our derivative inventory in an orderly manner is a critical component of our efforts to ensure that Goldman Sachs can be resolved without significant risk to the financial system. The preferred resolution strategy for our derivative inventory is an orderly and active wind-down of all positions over an 18-month period. This strategy is highly consistent with the actions of market participants who have exited derivatives businesses in the past.

Assumptions:

For the purpose of our analysis, we have assumed that material operating entities work in a cooperative manner to wind down their derivative inventory: we believe that this is a reasonable assumption because it results in the most economically beneficial outcome for all of them.

We also believe it reasonable to expect most derivative counterparties to seek to reduce their exposure to entities that have just lost investment grade status, and would therefore be willing to give permission to novate.

Our analysis is based on the segmentation of our derivative inventory that is used for both business-as-usual risk-management and “Volcker Rule” reporting, because these segments represent groupings of transactions with broadly homogenous risk and asset types.

Our analysis also assumes the following constraints specified by the Agencies for our preferred strategy:

- Our derivatives entities are sub-investment grade and do not re-establish investment grade status at any point in the wind-down. As a result, the firm has no access to the bilateral OTC market and we therefore use exchange-traded and cleared instruments for hedging purposes.
- To the extent it would be economically justified, counterparties (external or affiliates) exercise their contractual termination rights consistent with any rights stayed by the ISDA Resolution Stay Protocols or other applicable protocols.

Inter-Affiliate Transactions:

During the 18-month wind-down period, inter-affiliate derivative trades will continue to be supported and our practice of centralizing market risk management will continue as before. As portfolios of third party derivatives are sold, the corresponding inter-affiliate transactions are terminated at arm’s-length, mid-market prices. Consequently, all participating material operating entities are able to exit their inter-affiliate derivative transactions at the same time as the corresponding portfolios are sold.

Resources Used to Perform Analysis:

We have deployed substantial resources across the firm, from both the revenue-producing and control divisions, to ensure that our analyses are sufficiently granular and reflect all the important characteristics of our derivative inventory. We developed our analyses using historical data, market information and expert management judgment.

We use the same technology platform to model the wind-down of our derivative inventory as to generate the firm’s liquidity (RLEN) and capital (RCEN) metrics. Consequently, any action that is modeled in the derivative wind-down strategy is simultaneously reflected in the RLEN and RCEN estimates. Furthermore, our business-as-usual IT systems have the functionality required to produce data at a sufficiently granular level of detail to facilitate timely decision-making.

In the event that our derivative inventory needs to be wound down in practice, we believe that we have the resources and the technical know-how to do so: we have used business-as-usual systems to perform our analyses, and these would continue to function in a resolution scenario. In addition, we expect that our employee retention plan would ensure that the technical know-how would remain at the firm, and that our governance framework would continue to support and guide the trading decisions.

Portfolio Segmentation and Forecasting

We have the capability to produce a spectrum of derivatives portfolio analyses across a wide range of dimensions, such as by legal entity, trading desk, product, cleared vs. clearable vs. non-

clearable trades, counterparty type, currency, maturity, level of collateralization, and netting set. We also have the capability to segment and analyze the full contractual maturity (run-off) profile of our external and inter-affiliate derivatives portfolios.

Ease of Exit Position Analysis

We describe the categorization of our derivative positions within each business area, and at an overall firm level, highlighting those we consider more difficult to exit. This segmentation reflects the characteristics that we believe could affect the cost and operational effort required to exit our derivative portfolios

Application of Exit Cost Methodology

Our exit cost methodology, which is applied primarily at a portfolio level, forecasts the range of costs and liquidity required to exit our derivative positions. The main drivers of these costs are:

- Risk management costs: The firm enters into hedges to replace derivatives that terminate or contractually mature.
- Portfolio exit costs: We use a methodology based on the return on equity capital to estimate portfolio exit costs.
- Basis risk: Basis risk arises because material entities would not be able to access the bilateral OTC market after Group Inc. has entered bankruptcy proceedings, and would therefore only be able to hedge using listed or cleared instruments. We assess and quantify this risk.
- Operating expenses: We have calculated the operating expenses required to support our preferred derivatives wind-down strategy, and presented them separately from other operating expenses required to execute the rest of the firm's resolution strategy.

Analysis of operational capacity

We have performed an assessment of the operational resources required to execute our preferred resolution strategy; this includes an analysis of our ability to segment, package and novate derivatives portfolios, taking account of the systems capabilities needed to generate the information packages that potential step-in counterparties would require. We conclude that we have the operational capacity to support our preferred strategy for the wind-down of our derivatives portfolios.

Capabilities - Prime Brokerage Customer Account Transfers

We have taken steps to help ensure that the clients of our prime brokerage business are ready and able to transfer their business to alternative service providers in a manner that neither disrupts their business nor exacerbates the firm's liquidity position. Specifically:

- Most clients now maintain multiple prime brokerage relationships;
- We have built automated tools to enable streamlined transfers of assets across legal entities and custody platforms; and
- We have developed plans to help ensure that all prime brokerage clients' cash can be transferred to third parties during the wind-down phase.

5. Resolution Plan Governance and Challenge

Introduction

Our resolution planning process is extensive and complex, involving hundreds of members of staff across numerous different disciplines and geographic locations, to best leverage the required expertise. For such a process to be successful, a robust governance structure is essential: this helps ensure that our Board and senior management are in a position to exert oversight, challenge assumptions and give direction; it also helps ensure that the various strands of work are appropriately connected and organized so that the final plan does not contain gaps or inconsistencies.

Oversight Bodies

The following committees and steering groups have overseen our resolution planning process:

- **Board of Directors:** As the body responsible for overseeing the firm's strategic direction and the performance of its business and management, our Board monitors the development of the Resolution Plan, challenges its assumptions and ensures that adequate resources are provided for the many projects needed to be undertaken. Our Board reviews and approves the Resolution Plan before it is submitted to the Agencies. It also reviews and approves any material changes to the Resolution Plan that may occur.
- **Senior Management:** Senior executives of GS Group coordinate the development and maintenance of our Resolution Plan, and are also responsible for presenting the Resolution Plan to our Board for its review and approval.
- **Firmwide Enterprise Risk Committee:** This committee is responsible for overseeing all of our financial and non-financial risks. As part of such oversight, the committee is responsible for the ongoing review, approval and monitoring of the firm's enterprise risk management framework, as well as our risk limits framework. It reviews and approves the Resolution Plan before it is submitted to our Board.
- **Firmwide Asset Liability Committee (FALCO):** This committee reviews and approves the strategic direction for the firm's financial resources, including capital, liquidity, funding and balance sheet. This Committee approves the Firm's Recovery and Resolution Policy and reviews the Resolution Plan before it is submitted to our Board.
- **Recovery and Resolution Steering Group:** The Recovery and Resolution Steering Group meets weekly and is co-chaired by the firm's Chief Credit Officer and Head of Securities Division Operations. Members of the Recovery and Resolution Steering Group include the Steering Group Operating Officer (described below) and representatives of a wide range of departments. The Recovery and Resolution Steering Group develops and maintains the Resolution Plan, is responsible for ensuring that it contains information required by the relevant rules, provides direction and strategy, helps to resolve issues, makes policy decisions, approves scope changes and sets deliverables. The Recovery and Resolution Steering Group also acts as a liaison with senior executives and the Agencies.

- Steering Group Operating Officer: This is the senior management official primarily responsible for overseeing the development, maintenance, implementation and filing of the Resolution Plan in compliance with the Agencies' resolution planning regulations and guidance. The Steering Group Operating Officer is the content expert who is responsible for the day-to-day management of activities related to the Resolution Plan, including coordination of the activities of various capability leads (see below).
- Recovery and Resolution Capability Leads: The Capability Leads are subject matter experts who have ownership of individual capabilities in the Resolution Plan. They are responsible for setting goals and objectives, keeping abreast of plan activities, and ensuring completion of major deliverables.
- Firmwide Regulatory Remediation and Engagement Committee: This committee is charged with ensuring that all regulatory findings are resolved to the satisfaction of senior management, Internal Audit, our Board and, ultimately, the Agencies. It reviewed the remediation of the shortcoming that was identified by the Agencies in our 2017 Resolution Plan.
- Other governance bodies: Other committees and working groups complement our governance mechanisms through their work on specific aspects of resolution planning. They include the Firmwide Model Risk Control Committee, Liquidity Risk Management, the Legal Entity and Booking Model Working Group, and the Regulatory Capital and Reporting Review Group. In addition, Internal Audit performs a review of various aspects of our resolution planning processes.

Challenge

In April 2019, we conducted a two-day simulation exercise to test and challenge key elements of our contingency funding plan, contingency capital plan, recovery plan, and resolution plan. The exercise involved senior decision-makers at the firm, including our Chief Financial Officer, Chief Risk Officer, Controller, Treasurer, the co-heads of the Recovery and Resolution Steering Group, several functional and regional business leaders, and representatives of various material operating entities.

The primary objectives of the simulation exercise were to:

- Evaluate the coherence of our contingency plans as the firm moved from business-as-usual conditions, through severe stress, eventually taking a decision to proceed to resolution.
- Test core elements of our preparedness capabilities, with the goal of ensuring that:
 - Governance escalation protocols and decision-making are appropriately structured;
 - Management information systems are adequate and sufficiently timely to support required decision-making;
 - Communication protocols are aligned with escalation and actions; and
 - Operational aspects of contingency planning execution are capable of supporting contingency plan execution.

- Engage with senior members of management in order to raise their awareness of resolution-related issues and of the tools available to them, and to have them challenge current assumptions.
- Re-verify our ability to produce the data required for a bankruptcy filing in a timely fashion.

Overall, the simulation exercise showed that each of the plans we tested is robust, and highlighted no significant impediments. The simulation further demonstrated familiarity, both functionally and jurisdictionally across the firm, with both the plans themselves and the various responsibilities under the plans. Nevertheless, we did identify certain “lessons learned,” and have put project plans in place to more fully consider and, where appropriate, address them.

Supporting Information

The following pages contain background information about Goldman Sachs as support and context for our resolution strategy.

SI 1. Description of Core Business Lines

Introduction

Goldman Sachs is a leading global investment banking, securities and investment management firm that provides a wide range of financial services to a substantial and diversified client base that includes corporations, financial institutions, governments and individuals.

Details about our businesses are included in our Annual Report on Form 10-K for the year ended December 31, 2018 (our “2018 Form 10-K”). All references to 2018, 2017 and 2016 refer to our years ended, or the dates, as the context requires, December 31, 2018, December 31, 2017 and December 31, 2016, respectively.

Group Inc. is a bank holding company and a financial holding company regulated by the Federal Reserve. Our U.S. depository institution subsidiary, GS Bank, is a New York State-chartered bank.

Goldman Sachs has a number of important businesses within our four business segments: Investment Banking, Institutional Client Services, Investing & Lending and Investment Management. These businesses are the core of the Goldman Sachs franchise and allow us to serve clients and execute our strategy on a global basis. Recovery planning requires a definition of “core” and “non-core” businesses based on the ability of a firm to separate business lines for sale or closure, to raise or preserve liquidity, increase capital ratios and reduce balance sheet size.

Resolution planning, in contrast, requires a further definition of “core” because certain businesses (i.e., those business lines and associated support operations, services and functions that, upon failure, would result in a material loss of revenue, profit or franchise value) may need to be singled out for specific actions as part of a resolution exercise. We define these business lines, which are primarily included in our Investment Banking and Institutional Client Services segments, as core business lines. Other businesses in our Investing & Lending and Investment Management segments are important for GS Group, but have not been defined as core business lines for purposes of the Resolution Plan.

The remainder of this Section describes only the firm’s core business lines.

Investment Banking

Investment Banking serves public and private sector clients around the world. We provide financial advisory services and help companies raise capital to strengthen and grow their businesses. We seek to develop and maintain long-term relationships with a diverse global group of institutional clients, including corporates, governments, states and municipalities. Our goal is to deliver to our institutional clients the entire resources of the firm in a seamless fashion, with investment banking serving as the main initial point of contact with Goldman Sachs.

Financial Advisory. We are a leader in providing financial advisory services, including strategic advisory assignments with respect to mergers and acquisitions, divestitures, corporate defense

activities, restructurings, spin-offs and risk management. In particular, we help clients execute large, complex transactions for which we provide multiple services, including cross-border structuring expertise. Financial Advisory also includes revenues from derivative transactions directly related to these client advisory assignments. We also assist our clients in managing their asset and liability exposures and their capital.

Underwriting. The other core activity of Investment Banking is helping companies raise capital to fund their businesses. As a financial intermediary, our job is to match the capital of our investing clients, who aim to grow the savings of millions of people, with the needs of our public and private sector clients, who need financing to generate growth, create jobs and deliver products and services. Our underwriting activities include public offerings and private placements, including local and cross-border transactions and acquisition financing, of a wide range of securities and other financial instruments, including loans. Underwriting also includes revenues from derivative transactions entered into with public and private sector clients in connection with our underwriting activities.

- **Equity Underwriting.** We underwrite common and preferred stock and convertible and exchangeable securities. We regularly receive mandates for large, complex transactions and have held a leading position in worldwide public common stock offerings and worldwide initial public offerings for many years.
- **Debt Underwriting.** We underwrite and originate various types of debt instruments, including investment-grade and high-yield debt, bank loans and bridge loans, including in connection with acquisition financing, and emerging- and growth-market debt, which may be issued by, among others, corporate, sovereign, municipal and agency issuers. In addition, we underwrite and originate structured securities, which include mortgage-related securities and other asset-backed securities.

Institutional Client Services

Institutional Client Services serves our clients who come to us to buy and sell financial products, raise funding and manage risk. We do this by acting as a market maker and offering market expertise on a global basis. Institutional Client Services makes markets and facilitates client transactions in fixed income, equity, currency and commodity products. In addition, we make markets in and clear client transactions on major stock, options and futures exchanges worldwide.

Market makers provide liquidity and play a critical role in price discovery, which contributes to the overall efficiency of the capital markets. Our willingness to make markets, commit capital and take risk in a broad range of products is crucial to our client relationships.

Institutional Client Services activities are organized by asset class and include both “cash” and “derivative” instruments. “Cash” refers to trading the underlying instrument (such as a stock, bond or barrel of oil). “Derivative” refers to instruments that derive their value from underlying asset prices, indices, reference rates and other inputs, or a combination of these factors (such as an option, which is the right or obligation to buy or sell a certain bond, stock or other asset on a

specified date in the future at a certain price, or an interest rate swap, which is the agreement to convert a fixed rate of interest into a floating rate or vice versa).

Our Institutional Client Services segment consists of the following:

Fixed Income, Currency and Commodities (FICC) Client Execution. Includes client execution activities related to making markets in both cash and derivative instruments for interest rate products, credit products, mortgages, currencies and commodities.

- **Interest Rate Products.** Government bonds (including inflation-linked securities) across maturities, other government-backed securities, securities sold under repurchase agreements, and interest rate swaps, options and other derivatives.
- **Credit Products.** Investment-grade corporate securities, high-yield securities, credit derivatives, exchange-traded funds, bank and bridge loans, municipal securities, emerging market and distressed debt, and trade claims.
- **Mortgages.** Commercial mortgage-related securities, loans and derivatives, residential mortgage-related securities, loans and derivatives (including U.S. government agency-issued collateralized mortgage obligations and other securities and loans), and other asset-backed securities, loans and derivatives.
- **Currencies.** Currency options, spot/forwards and other derivatives on G-10 currencies and emerging-market products.
- **Commodities.** Commodity derivatives and, to a lesser extent, physical commodities, involving crude oil and petroleum products, natural gas, base, precious and other metals, electricity, coal, agricultural and other commodity products.

Equities. Includes client execution activities related to making markets in equity products and commissions and fees from executing and clearing institutional client transactions on major stock, options and futures exchanges worldwide, as well as OTC transactions. Equities also includes our securities services business, which provides financing, securities lending and other prime brokerage services to institutional clients, including hedge funds, mutual funds, pension funds and foundations, and generates revenues primarily in the form of interest rate spreads or fees.

Market-Making Activities

As a market maker, we facilitate transactions in both liquid and less liquid markets, primarily for institutional clients, such as corporations, financial institutions, investment funds and governments, to assist clients in meeting their investment objectives and in managing their risks. In this role, we seek to earn the difference between the price at which a market participant is willing to sell an instrument to us and the price at which another market participant is willing to buy it from us, and vice versa (i.e., bid/offer spread). In addition, we maintain inventory, typically for a short period of time, in response to, or in anticipation of, client demand. We also hold inventory to actively manage our risk exposures that arise from these market-making activities.

Our results are influenced by a combination of interconnected drivers, including (i) client activity levels and transactional bid/offer spreads, and (ii) changes in the fair value of our inventory and interest income and interest expense related to the holding, hedging and funding of our inventory.

The amount and composition of our net revenues vary over time as these drivers are impacted by multiple interrelated factors affecting economic and market conditions, including volatility and liquidity in the market, changes in interest rates, currency exchange rates, credit spreads, equity prices and commodity prices, investor confidence, and other macroeconomic concerns and uncertainties.

SI 2. Material Entities and their Operational and Financial Interconnectedness

We have designated those subsidiaries of the firm that are significant to the activities of a critical operation or core business line as “material entities.” We distinguish between material operating entities (those that are engaged in an operating business) and material service entities (those that provide services to other material entities).

The following list summarizes the principal activities of our material entities:

| Material Entities | Principal Activities | Country or State of Incorporation |
|--|--|--|
| Covered Company | | |
| The Goldman Sachs Group, Inc. | Parent Holding Company | Delaware |
| Material Operating Entities | | |
| Goldman Sachs & Co. LLC | Broker-Dealer | New York |
| Goldman Sachs International | Broker-Dealer | England |
| Goldman Sachs Bank USA | Insured Depository Institution | New York |
| J. Aron & Company LLC | Commodity Market Maker | New York |
| Goldman Sachs Japan Co., Ltd | Broker-Dealer | Japan |
| Goldman Sachs International Bank | Bank | England |
| Goldman Sachs Asset Management, L.P. | Investment Advisor | Delaware |
| Goldman Sachs Asset Management International | Investment Advisor | England |
| Material Service Entities | | |
| Goldman Sachs Funding LLC | Funding IHC | Delaware |
| Goldman Sachs Services Private Limited | Staffing Service Entity | India |
| Goldman Sachs Services LLC | Staffing Service Entity | Delaware |
| Goldman Sachs Property Management | Physical Asset Service Entity | England |
| Goldman Sachs Property Management USA LLC | Physical Asset Service Entity | Delaware |
| Goldman Sachs Services (Asia) Limited | Staffing/Physical Asset Service Entity | Hong Kong |
| Goldman Sachs Services (Singapore) Pte. Ltd. | Staffing/Physical Asset Service Entity | Singapore |
| Goldman Sachs (UK) Svc. Limited | Staffing Service Entity | England |
| Goldman Sachs Japan Services Co., Ltd. | Staffing/Physical Asset Service Entity | Japan |

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Financial Information by Material Entity as of December 31, 2018

We consider that a subsidiary is significant to the activities of a critical operation or core business line if it accounts for more than 10% of a core business line's revenues, houses a significant portion of a critical operation, or holds more than a "de minimis" percentage¹³ of our support staff or technology assets.

The following is a summary of key financial metrics for our material entities:

| \$ in billions | Total Assets | Total Liabilities excluding capital and unsecured intercompany debt | Capital and Unsecured Intercompany Debt ¹ | Net Revenues ² | Pre-Tax Earnings ² |
|--------------------------------------|--------------|---|--|---------------------------|-------------------------------|
| | \$ | \$ | \$ | \$ | \$ |
| The Goldman Sachs Group, Inc. | 334.0 | 212.9 | 90.2 | -2.9 | -4.4 |
| Goldman Sachs & Co. LLC | 416.5 | 365.8 | 50.7 | 13.4 | 4.4 |
| Goldman Sachs International | 410.2 | 314.6 | 95.6 | 7.5 | 2.6 |
| Goldman Sachs Bank USA | 191.5 | 148.0 | 43.5 | 5.2 | 2.7 |
| J. Aron & Company LLC | 19.2 | 16.3 | 2.9 | 0.7 | 0.1 |
| Goldman Sachs Japan Co., Ltd. | 91.3 | 78.5 | 12.8 | 0.6 | 0.1 |
| Goldman Sachs International Bank | 40.7 | 36.2 | 4.5 | 0.2 | 0.1 |
| Goldman Sachs Asset Management L.P. | 1.0 | 0.2 | 0.8 | 2.0 | 0.4 |
| Goldman Sachs Asset Management Int'l | 0.5 | 0.1 | 0.4 | 1.0 | 0.1 |
| Goldman Sachs Funding LLC | 132.0 | 0.2 | 131.8 | 0.5 | 0.5 |
| Material service entities | 3.4 | 1.2 | 2.3 | 2.7 | 0.4 |

Note 1: The amount quoted for The Goldman Sachs Group, Inc. does not include unsecured intercompany debt; the amount quoted for Goldman Sachs Bank USA includes deposits from affiliates

Note 2: The amount quoted for The Goldman Sachs Group, Inc. does not include dividends or equity in the earnings of subsidiaries

Information in the table above has been prepared in accordance with U.S. Generally Accepted Accounting Principles on a stand-alone entity basis.

¹³ For these purposes, we consider more than 3% of support staff, 5% of technology assets, or 2% of both in the same entity to be greater than "de minimis"

Interconnectedness among Material Entities

Both the nature of our businesses and our corporate legal entity structure give rise to financial and operational interconnectedness among subsidiaries within our group, and between our parent company and subsidiaries. We have identified the following areas of interconnectedness:

Intercompany Transactions. Group Inc. and its subsidiaries enter into transactions with each other for risk management, client facilitation and other reasons. Such transactions are based on agreed terms in intercompany agreements, entered into on an arms' length basis and appropriately collateralized on a next day basis. In order to facilitate transactions with clients in other countries, our material operating entities offer introducing arrangements for other affiliates; this practice would cease in resolution when we stop entering into new transactions with counterparties.

The principal intercompany transactional or hedging relationships between our material operating entities as at December 2018 are set out below:

| | Group Inc. | GS&Co. | GSI | GS Bank USA | JANY | GSJCL | GSIB | GSAM | GSAMI |
|-------------|------------|--------|-----|-------------|------|-------|------|------|-------|
| Group Inc. | | | | | | | | | |
| GS&Co. | X | | | | | | | | |
| GSI | X | X | | | | | | | |
| GS Bank USA | X | X | X | | | | | | |
| JANY | X | X | X | X | | | | | |
| GSJCL | | | X | X | X | | | | |
| GSIB | | X | X | X | | | | | |
| GSAM | | | | | | | | | |
| GSAMI | | X | X | | | | | | |

x = Transactional or Hedging relationship

We have devoted substantial resources to reducing this aspect of interconnectedness, primarily through trade compressions (whereby offsetting and near-offsetting OTC derivative transactions are matched and bi-laterally terminated at mutually agreed prices), clearing of intercompany transactions, collateralization of exposures and better alignment of client transactions and risk-management entities. Other steps we have taken are discussed in more detail below (see “Actions we have taken to mitigate the effect of interconnectedness and ensure a more rational, less complex legal entity structure”).

Subsidiary Capital and Funding Policies. Equity capital is raised by Group Inc., which downstreams capital to its subsidiaries to meet their capital needs. The majority of the firm’s

unsecured funding is also raised by Group Inc., which lends a portion of it to Funding IHC pursuant to a subordinated funding note (Funding Note)¹⁴. Funding IHC lends some of these funds to certain material entities to meet their funding and liquidity needs, and extends loans to Group Inc. via a revolving loan facility (Revolver)¹⁴ to meet the funding and liquidity requirements of Group Inc. and Group Inc.’s subsidiaries. The benefits of a centralized approach to subsidiary capitalization and funding include enhanced control and greater flexibility to meet our subsidiaries’ changing requirements. Funding is also raised at the subsidiary level through a variety of products, including secured funding, unsecured borrowings and deposits.

The table below reflects the material¹⁵ unsecured funding relationships among Group Inc., Funding IHC and material operating entities.

| Funding Relationships between Material Operating Entities | | | |
|--|---|---------------------------------------|-----------------------------------|
| Material Entity | Borrows from Parent or Funding IHC | Borrows from Material Entities | Lends to Material Entities |
| Group Inc. | ✓ | ✓ | ✓ |
| GS&Co. | ✓ | ✗ | ✗ |
| GSI | ✓ | ✓ | ✗ |
| GS Bank | ✓ | ✗ | ✗ |
| JANY | ✗ | ✗ | ✓ |
| GSJCL | ✓ | ✗ | ✗ |
| GSIB | ✗ | ✗ | ✓ |
| GSAM | ✗ | ✗ | ✗ |
| GSAMI | ✗ | ✗ | ✗ |

To mitigate the risk of disruption to our inter-company funding, we have pre-positioned liquidity and intercompany debt at key material entities; we also hold substantial liquidity at our parent company and Funding IHC, which gives us the flexibility to place additional liquidity at affiliates in the event that it is required.

Secured Funding. Many of the firm’s material operating entities lend to and borrow from each other on a secured basis, generally as a mechanism for collateral realignment, cash reinvestment, or sourcing securities for an entity’s GCLA. The majority of these transactions are collateralized by GCLA-eligible securities, which are highly liquid. A significant portion of the remainder relates to the covering of short positions, which allows the lending entity to manage risk, or is used for collateral and funding optimization.

¹⁴ Both the Funding Note and the Revolver are part of the CLSA

¹⁵ Balances of more than \$500 million as of December 2018 are considered material.

Cross-default Provisions. Historically, documents that govern our OTC derivative transactions usually contained “cross-default” provisions; these give counterparties the right to terminate their transactions with one Goldman Sachs legal entity, even if it is solvent and performing its obligations under the transaction, because of certain credit-related events at certain other Goldman Sachs legal entities. However, we have mitigated the effect of cross-default provisions; all of our affiliates that engage in external derivatives activity under ISDA Master Agreements have signed the ISDA Resolution Stay Protocols. In the event of resolution, these impose a stay on certain cross-default and early termination rights in standard ISDA derivative, repo and securities lending contracts with other adhering counterparties. Consequently, our intercompany derivatives are afforded the protection of the ISDA Resolution Stay Protocols.

Guarantees of Subsidiaries. Group Inc. has guaranteed the payment obligations of GS&Co. and GS Bank, subject to certain exceptions. Group Inc. also provides guarantees to clients in respect of certain transactions entered into by subsidiary companies. GS Group subsidiaries only provide guarantees to other subsidiary companies on a very limited basis. We do not have and do not permit upstream guarantees of the parent company by its subsidiaries. Group Inc. guarantees do not contain cross-default provisions, and do not on their own trigger early termination rights.

In order to mitigate this aspect of interconnectedness, we have obtained at least one stand-alone rating from a major credit rating agency for each of our five largest material operating entities. The resolution-related benefit of this is to reduce the number of transactional guarantees that Group Inc. is required to issue.

Access to Market Infrastructure. Certain GS Group subsidiaries provide other affiliates with access to various FMUs such as exchanges, clearing houses, custodians and agent banks. Such transactions are governed by intercompany agreements and charged at arms’ length pricing.

The table below shows our material operating entities’ relationships with the FMUs, including agent banks, that are most important to them. Entities with direct membership in an FMU are marked with an “X,” while those accessing the FMU indirectly through another entity are marked with the material entity providing access to the FMU. For example, GS&Co. provides access to GSI at the Chicago Mercantile Exchange Clearing, Inc. Note that, in the case of two critical FMUs in Canada, access is via our Canadian affiliate, Goldman Sachs Canada Inc. (GS Canada), which is not a material entity; however, we have identified alternative strategies to provide our clients and material operating entities with ongoing access to these FMUs in a resolution scenario. Other than GS Canada, none of the entities that provide other material operating entities access to FMUs are projected to go into proceedings.

Material Operating Entities' Access to Financial Market Utilities

| | Group Inc. | GS&Co. | GSJ | GS Bank USA | JANY | GSJCL | GSIB | GSAM | GSAMI |
|---|------------|--------|-----|-------------|------|-------|------|------|-------|
| Bank of New York Mellon | X | X | X | X | X | X | A | | |
| Canadian Depository for Securities | | C | C | C | | | | | |
| Canadian Derivatives Clearing Corporation | | C | C | C | C | | C | | |
| Chicago Mercantile Exchange Clearing, Inc. | | X | A | A | A | A | A | | |
| Citibank, N.A. | X | X | X | X | X | X | X | X | X |
| CLS Bank Limited | | B | B | X | B | B | B | | |
| Depository Trust Company | | X | X | X | | | | | |
| Eurex Clearing AG | | D | X | D | D | | X | | |
| Euroclear Bank | X | X | X | X | X | X | X | | |
| Euroclear UK and Ireland | | D | X | D | | | X | | |
| Fixed Income Clearing Corporation | | X | A | A | | | | | |
| HSBC | X | X | X | X | X | X | X | X | X |
| ICE Clear Credit LLC | | X | X | D | D | | D | | |
| ICE Clear Europe | | X | X | D | D | D | D | | |
| ICE Clear U.S. | | X | A | A | A | | A | | |
| Japan Securities Clearing Corporation | | E | E | E | | X | | | |
| Japan Securities Depository | | E | E | | | X | | | |
| LCH Clearnet Ltd. | D | X | X | X | D | | X | | |
| LCH Clearnet S.A. | | D | X | D | D | | X | | |
| National Securities Clearing Corporation Ltd. | | X | A | A | | | | | |
| Options Clearing Corporation | | X | A | | A | A | | | |
| Standard Chartered Bank | X | X | X | X | X | X | X | | |
| SWIFT | | X | X | X | | X | X | X | X |

X = Direct Access; A = Access via GS&Co.; B = Access via GS Bank; C = Access via GS Canada;
D = Access via GSI; E = Access via GSJCL

Note that, in the table above, Euroclear Bank and Euroclear UK and Ireland are shown separately, although they are treated as a single entity for purposes of the assessment of critical FMUs.

We have prepared contingency plans as a backup in the event that one of the material operating entities providing FMU access to other affiliates were to go into bankruptcy; depending on the FMU,

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these plans include options for multiple entity access, alternative contingency arrangements, or the use of a third-party service provider.

Operational Services. GS Group subsidiaries regularly provide services to each other based on intercompany agreements, for which services arms' length fees are paid. Such services may relate to: employee services; technology or intellectual property; facilities and other fixed assets; and vendor services.

The table below illustrates the services provided and received by material entities:

| | | RECEIVES | | | | | | | | | | | | | | | | | | |
|--|-------------|--------------|-----------|------|-----|---------|------|-------|------|------|-------|-------------|------|------|------|------|------|------|------|------|
| | | All Entities | Group Inc | GSCO | GSI | GS Bank | JANY | GSJCL | GSIB | GSAM | GSAMI | Funding IHC | GSSE | GSPW | GSPM | GPMU | GHKL | GPMS | GSUL | GSJS |
| P R O V I D E S | Group Inc | IP, V | | F | | F | F | | | | | | | F | | F | | | | |
| | GSCO | IP, V | P | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| | GSI | IP, V | P | P | | P | P | P | P | P | P | P | P | | P, F | P | P | P | P, F | P |
| | GS Bank | IP | | | | | | | | | | | | | | | | | | |
| | JANY | IP | | | | | | | | | | | | | | | | | | |
| | GSJCL | IP | P | P | P | P | | | P | P | P | P | P | P | P | P | P | P | P | P |
| | GSIB | IP | | | | | | | | | | | | | | | | | | |
| | GSAM | IP | | | | | | | | | | | | | | | | | | |
| | GSAMI | IP | | | | | | | | | | | | | | | | | | |
| | Funding IHC | | | | | | | | | | | | | | | | | | | |
| | GSSE | | P | P | P | | P | P | P | P | P | | | P | P | P | P | P | P | P |
| | GSPW | | P | P | P | | P | P | P | P | P | P | | | P | P | P | P | P | P |
| | GSPM | | T | T | T | | T | T | T | T | T | T | T | T | | T | T | T | T | T |
| | GPMU | | T | T | T | | T | T | T | T | T | T | T | T | T | | T | T | T | T |
| | GHKL | | T | P | P | P | | P | P | P | P | P | P | P | P | P | | P | P | P |
| | GPMS | | T | P | P | P | | P | P | P | P | P | P | P | P | P | P | | P | P |
| | GSUL | | P | P | P | | P | P | P | P | P | P | P | P | P | P | P | | P | P |
| | GSJS | | V, T | P | P | P | | P | P, F | P | P | P | P | P | P | P | P | P | P | P |

P = PERSONNEL, IP = INTELLECTUAL PROPERTY, T = TECHNOLOGY ASSETS, F = FACILITIES, V = VENDORS

We have reduced the risks relating to affiliates' dependency on other affiliates for the provision of shared services by documenting such services in legal agreements that provide for continuity of service, even if a contracting entity enters some form of insolvency proceeding.

Actions we have taken to mitigate the effect of interconnectedness and ensure a more rational, less complex legal entity structure:

We have established the following criteria to mitigate interconnectedness and ensure a more rational and less complex legal entity structure:

1. Separation of Core from Non-Core Businesses:
 - Core business activities and critical operations should be conducted in a small number of large, well-capitalized and well-funded entities (i.e. material operating entities)
 - Market risk of core business activities should be centrally managed within a limited number of material operating entities

- Non-core business activities that are likely to be spun off in a resolution scenario should be conducted in separate legal entity groups that facilitate separability in resolution
- Entities with common roles should be grouped into separate ownership chains under common holding companies (e.g., operating entity groups, service entity groups and investing entity groups)
- The domicile of legal entities should be aligned with their principal place of business.

In resolution, the separation of core from non-core businesses allows the firm to concentrate its financial resources where they would have the greatest impact (i.e. on the core business lines and critical operations), and simplifies the spin-off of non-core businesses because they do not need to be “unraveled” from the rest of the business.

2. As Few Entities as Possible:

- Our core businesses and critical operations should be conducted in the smallest number of operating entities that legal, regulatory, risk and resolvability considerations will allow;
- Unless specific circumstances warrant, there should not be more than one of the following category of operating entity in any jurisdiction:
 - i. a bank;
 - ii. a broker-dealer;
 - iii. an asset manager.
- Our investing businesses should be conducted in as few legal entities as legal, regulatory, co-investing and other business efficiency considerations will allow;
- Redundant and dormant entities should be wound down.

A smaller number of legal entities reduces the complexity of resolution and decreases the likelihood of conflicting resolution regimes or of part of a business activity going into insolvency proceedings and part remaining out of proceedings.

3. Short, Clean Entity Ownership Lines and Guarantee Flows:

- Operating entities should not have cross-holdings in each other;
- Material operating and material service entities should not be owned by another material operating or material service entity;
- There should be as few intermediate holding companies as regulatory or other considerations permit;
- Fractional or split ownership of material entities should be avoided.

Short, simple lines of ownership not only reduce the complexity of resolution, but also reduce the likelihood that the provision of financial support to material entities will be impeded at an intermediate step in the ownership chain.

4. Clean Funding Pathways:

- External TLAC should only be issued by the parent company;

- Internal TLAC should be provided in a manner that preserves flexibility and efficiency of deployment;
- Mechanisms should be in place to make capital and liquidity available to surviving material entities in a resolution scenario:
 - i. in sufficient quantity and in a sufficiently timely manner that these entities can be wound down in an orderly fashion;
 - ii. in a manner that mitigates potential conflicts of interest arising as a result of the forgiveness or conversion of debt;
 - iii. in a manner that mitigates uncertainty related to potential creditor challenge.

The resolution benefit of these criteria is that they reduce the likelihood that creditor challenge will impede the process of providing financial support to material entities and afford additional flexibility to provide additional resources during the wind-down period.

5. Intercompany Arrangements that Mitigate Interconnectedness:

- Intercompany guarantees should emanate only from the parent company and flow downstream to subsidiaries;
- Derivative and secured funding contracts with external third parties should not contain cross-default provisions;
- The number of intercompany derivative transactions should be reduced to the extent practicable:
 - i. Where possible, clients should transact with the legal entity that manages the related market risk;
 - ii. Where such alignment of clients with risk-management entities is not possible, intercompany transactions should be minimized using intercompany clearing or internal compression techniques, where available;
 - iii. Intercompany transactions should be booked and risk managed in a manner consistent with external derivative transactions, they should be collateralized on a daily basis and, in the event of default by one affiliate party, they should close out at mid-market prices.
- Intercompany receivables of any nature should be settled regularly.

Intercompany arrangements that mitigate interconnectedness reduce the likelihood that the failure of one legal entity will bring about the failure of its affiliates.

6. Alignment of Resources with the Entities they Serve:

- Staff should normally be employed by the entity that benefits from their services or by an operationally and financially resilient service entity;
- If staff are not employed by (or formally seconded to) the entity to which they provide services (for example, because they are employed by a service entity, because they work for several legal entities, because they live in a different country, or because of local

- registration requirements), the service they provide should be documented in a service-level agreement that allows for the continued provision of services in a resolution scenario;
- Technology assets should normally be held on the balance sheet of a financially resilient service entity unless they benefit only one entity, in which case they should be held on its balance sheet;
 - The use of technology assets or facilities by an entity that does not own them should be documented in an agreement that allows for the continued provision of services in a resolution scenario;
 - Legal entities should have properly documented ownership interests in, or access rights to, the intellectual property from which they benefit;
 - Entities that have a critical dependency on another group entity for access to an FMU should have contingency arrangements in place for alternative access;
 - Resolution-critical third-party vendors should be readily identifiable, and legal agreements with them should contain resolution-resilient clauses that prevent termination due to a bankruptcy or insolvency filing by the service receiver, allow for assignability to other GS Group entities, and promote the provision of transition services in resolution.

These criteria are designed to ensure that our major operating entities are not forced into premature liquidation because of inadequate non-financial resources such as staff, technology, intellectual property, physical assets or access to critical FMUs.

7. Protection of the Insured Depository Institution (IDI):

- Our parent company, whether acting directly or through our Funding IHC, should act as a source of strength for our IDI;
- Our IDI should hold sufficient capital and liquidity to meet its regulatory and internal requirements in a business-as-usual context;
- Our parent company and Funding IHC should provide the IDI with additional capital or liquidity required to meet its RCEN and RLEN requirements;
- The parent company and Funding IHC should ensure that there is sufficient internal TLAC to meet the IDI's RCAP requirements;
- The parent company and Funding IHC should ensure that there is sufficient excess liquidity to meet the IDI's RLAP requirements;
- The provisions of Regulation W must be met in all respects, as determined by the IDI itself;
- The number of intercompany derivative transactions involving the IDI should be reduced to the extent practicable:
 - i. Where possible, clients should transact directly with the IDI when it manages the related market risk, thereby minimizing the volume of intercompany derivative transactions;
 - ii. Where such alignment of clients with the IDI is not possible, intercompany transactions should be minimized or reduced using intercompany clearing or internal compression techniques, where available; and

- iii. Intercompany transactions should be booked and risk managed in a manner consistent with external derivative transactions.
- Shared services of which the IDI is a beneficiary should be documented in service level agreements.

These criteria are designed to help ensure that our insured depository institution would remain operational in the event that our parent company were to enter bankruptcy.

We acknowledge that there is inherent subjectivity in identifying whether or not an entity structure or transaction flow is complex, and recognize the need for senior and knowledgeable stakeholders to apply judgment in considering all factors that influence our corporate structure.

Resolution Strategy by Material Entity

The Goldman Sachs Group, Inc.

Description of Entity

As the parent company of the consolidated firm, Group Inc. is GS Group's "covered company"¹⁶. It is a Delaware corporation, and it is a bank holding company and a financial holding company regulated by the Federal Reserve. Its common stock is traded on the New York Stock Exchange under the symbol GS.

The firm's equity capital is raised by Group Inc., which downstreams capital to the firm's subsidiaries to support their business activities and meet their regulatory requirements, where applicable. The majority of the firm's unsecured funding is also raised by Group Inc., which primarily lends it to Funding IHC pursuant to the Funding Note. Funding IHC lends funds to Group Inc. via the revolving facility under the CLSA to meet the funding and liquidity requirements of Group Inc.

As a holding company, Group Inc. depends on dividends, distributions and other payments (e.g., payments on intercompany loans) from its subsidiaries to fund dividend payments and payments on its obligations, including debt obligations. Group Inc. has entered into derivative contracts, all of which are with affiliates, to hedge interest rate, currency, and other market risks related to its third-party borrowings and its equity investments in foreign subsidiaries. It does not enter into third-party OTC derivative transactions. Group Inc. operates in the United States with its principal office in New York, at the firm's global headquarters, which is located at 200 West Street, New York, NY.

Summary of Group Inc.'s Resolution Strategy

We believe that the most effective resolution strategy is one that meets the combined goals of facilitating an orderly wind-down of our material operating entities while being minimally disruptive to financial markets. Our strategy is a variant on the SPOE strategy, under which the parent company of a failing institution is resolved in proceedings, while leaving other key entities of the institution to continue their activities outside of resolution proceedings. The CLSA requires Funding IHC, both before and after a Group Inc. bankruptcy filing, to provide the participating material operating and service entities with the capital and liquidity they need to support their ongoing operations and facilitate their orderly wind-down outside of proceedings. We believe this strategy would ensure the continuity of critical operations at our subsidiaries, and would result in losses being incurred by our equity holders and creditors, not by taxpayers.

¹⁶ As defined under Section 165 of the Dodd-Frank Act.

Goldman Sachs & Co. LLC

| | |
|--------------------|---|
| Regulatory Status | <ul style="list-style-type: none"> Registered broker-dealer and futures commission merchant |
| Incorporation | <ul style="list-style-type: none"> Limited liability company organized in New York |
| Primary Regulators | <ul style="list-style-type: none"> Securities and Exchange Commission (SEC) Financial Industry Regulatory Authority, Inc. (FINRA) Commodity Futures Trading Commission (CFTC) |
| Ownership | <ul style="list-style-type: none"> Direct, wholly-owned subsidiary of Group Inc.¹⁷ |
| Office Location | <ul style="list-style-type: none"> New York, NY |
| Activities | <ul style="list-style-type: none"> Investment banking Securities trading and market making Investment management |
| Funding Sources | <ul style="list-style-type: none"> Unsecured funding from Group Inc. or Funding IHC No material unsecured borrowing from other material entities Borrows on a secured basis from affiliates (mainly GSI) |
| Other Matters | <ul style="list-style-type: none"> Client assets are protected under the rules of the SEC and CFTC |

Summary of GS&Co.'s Resolution Strategy

The CLSA requires Funding IHC, both before and after a Group Inc. bankruptcy filing, to provide GS&Co. with sufficient capital to meet its applicable capital requirements plus an operating buffer, and sufficient liquidity to meet its intraday liquidity requirements and prevent a payment default. This allows GS&Co., under our preferred resolution strategy, to remain out of proceedings while it winds itself down in an orderly manner over time. After Group Inc. enters bankruptcy proceedings, GS&Co. ceases to solicit new business, but retains the operational functionality needed to dispose of its assets and hedge its remaining risk positions. It continues to have access to shared services and FMUs throughout the resolution process; this prevents significant disruptions to clients holding cash or securities at GS&Co., and gives GS&Co. the flexibility to execute asset sales and derivative unwinds at a pace that avoids fire-sales or recourse to emergency government facilities.

We expect prime brokerage and other clients of GS&Co. to transfer their positions to other third-party providers. All securities inventory would be sold, and derivatives unwound through early terminations, contractual maturities, portfolio sales, novations or bilateral terminations. Once this process is complete, GS&Co.'s residual balance sheet would largely be cash, financed by a combination of debt and equity. Our strategy is designed with the goal of having sufficient liquidity and capital to pay GS&Co.'s third-party creditors in full, with any remaining amounts ultimately returned to the bankruptcy estate of the parent company.

¹⁷ Except for de minimis non-voting, non-participating interests.

Goldman Sachs International

| | |
|--------------------|---|
| Regulatory Status | <ul style="list-style-type: none"> • Regulated broker-dealer |
| Incorporation | <ul style="list-style-type: none"> • Unlimited company incorporated in England and Wales |
| Primary Regulators | <ul style="list-style-type: none"> • Prudential Regulation Authority and Financial Conduct Authority |
| Ownership | <ul style="list-style-type: none"> • Indirect, wholly-owned subsidiary of Group Inc. |
| Office Location | <ul style="list-style-type: none"> • London, England |
| Activities | <ul style="list-style-type: none"> • Investment banking • Securities trading and market making • Investment management |
| Funding Sources | <ul style="list-style-type: none"> • Unsecured funding primarily from its parent, Goldman Sachs Group UK Limited, and Funding IHC • Unsecured funding from third parties and other material entities • Secured borrowing from affiliates (primarily other material entities) |
| Other Matters | <ul style="list-style-type: none"> • Client assets are protected under Financial Conduct Authority rules |

Summary of GSI's Resolution Strategy

The CLSA requires Funding IHC, both before and after a Group Inc. bankruptcy filing, to provide GSI with sufficient capital to meet its applicable capital requirements plus an operating buffer, and sufficient liquidity to meet its intraday liquidity requirements and prevent a payment default. Accordingly, under our preferred resolution strategy, GSI remains out of proceedings while it winds itself down in an orderly manner over time. After Group Inc. enters bankruptcy proceedings, GSI ceases to solicit new business, but it retains the operational functionality needed to dispose of its assets and hedge its remaining risk positions. Because of the steps we have taken, it continues to have access to both shared services and FMUs throughout the resolution process. This strategy prevents significant disruptions to clients holding cash or securities in accounts at GSI, and gives it the flexibility to execute asset sales and derivative unwinds at a pace that avoids fire-sales or recourse to emergency government facilities.

We expect that prime brokerage and other clients of GSI would transfer their positions to alternate third-party providers. All securities inventory would be sold, and derivatives would be unwound either through early terminations, contractual maturities, portfolio sales, novations or bilateral terminations. After the market-making and client positions have been wound down, GSI's residual balance sheet would largely be cash, financed by a combination of debt and equity. Our strategy is designed with the goal of having sufficient liquidity and capital to pay GSI's third-party creditors in full, with any remaining amounts ultimately returned to the bankruptcy estate of the parent company.

Goldman Sachs Bank USA

| | |
|--------------------|--|
| Regulatory Status | <ul style="list-style-type: none"> • Insured Depository Institution • New York State-chartered bank • Member of Federal Reserve System |
| Incorporation | <ul style="list-style-type: none"> • GS Bank is chartered in New York |
| Primary Regulators | <ul style="list-style-type: none"> • Federal Reserve • FDIC • New York State Department of Financial Services • Consumer Financial Protection Bureau |
| Ownership | <ul style="list-style-type: none"> • Direct, wholly-owned subsidiary of Group Inc. |
| Office Location | <ul style="list-style-type: none"> • New York; branches elsewhere |
| Activities | <ul style="list-style-type: none"> • Deposit taking • Private bank, corporate lending and other lending • Market-making in derivative products and other related products • Extension of consumer loans through an online platform |
| Funding Sources | <ul style="list-style-type: none"> • Takes deposits from third parties • Takes deposits from Group Inc. and Funding IHC • Unsecured funding from Group Inc. and/or Funding IHC • No material unsecured borrowing from other material entities • Borrows on a secured basis from affiliates (primarily GS&Co.) • Unsecured third-party debt |

Summary of GS Bank's Resolution Strategy

The CLSA requires Funding IHC, both before and after a Group Inc. bankruptcy filing, to provide GS Bank with sufficient capital to meet its applicable capital requirements (including the requirements for “well capitalized” status under the prompt corrective action framework) plus an operating buffer, and sufficient liquidity to meet its intraday liquidity requirements and prevent a payment default. Accordingly, under our preferred resolution strategy, GS Bank remains out of proceedings while it winds itself down in an orderly manner over time. After Group Inc. enters bankruptcy proceedings, GS Bank ceases to solicit new business, but it retains the operational functionality needed to dispose of its assets and hedge its remaining risk positions, and it continues to have access to both shared services and FMUs throughout the resolution process. This strategy gives it the flexibility to execute asset sales and derivative unwinds at a pace that avoids fire-sales or the use of emergency government facilities.

Our projections indicate that, given the support provided by Funding IHC pursuant to the CLSA, GS Bank will have sufficient liquidity to give depositors access to their insured deposits. Certain deposits are assumed to be repaid at contractual maturity dates. Loan inventory would be sold and all uninsured deposits are assumed to be withdrawn. Derivatives would be unwound either through

early terminations, contractual maturities, portfolio sales, novations or bilateral terminations. Our strategy is designed with the goal of having sufficient capital and liquidity to pay GS Bank's depositors and other third-party creditors in full, with any remaining amounts ultimately returned to the bankruptcy estate of the parent company. Accordingly, our strategy is designed with the goal of having no impact to the FDIC's Deposit Insurance Fund.

GS Bank is required to submit its own resolution plan. In August 2018, the FDIC extended the next resolution plan filing deadline to no sooner than July 1, 2020. In April 2019, the FDIC released an advanced notice of proposed rulemaking about potential changes to its resolution planning requirements for IDIs, including GS Bank, and delayed the next round of IDI resolution plan submissions until the rulemaking process is complete.

J. Aron & Company LLC

| | |
|--------------------|---|
| Regulatory Status | <ul style="list-style-type: none"> • Swap dealer |
| Incorporation | <ul style="list-style-type: none"> • Limited liability company organized in New York |
| Primary Regulators | <ul style="list-style-type: none"> • CFTC • Federal Energy Regulatory Commission |
| Ownership | <ul style="list-style-type: none"> • Direct, wholly-owned subsidiary of Group Inc. |
| Office Location | <ul style="list-style-type: none"> • New York, NY |
| Activities | <ul style="list-style-type: none"> • Currencies and commodities trading and market-making |
| Funding Sources | <ul style="list-style-type: none"> • Unsecured funding from Group Inc. • No material borrowing relationships with other material entities |

Summary of JANY's Resolution Strategy

We have considered a range of options for the orderly resolution of JANY and have assessed the implications of an orderly wind-down of this entity both in and out of proceedings.

Under our preferred resolution strategy, we assume that JANY enters Chapter 11 proceedings along with Group Inc. In this scenario, we assume that JANY's derivatives close out immediately following the commencement of proceedings, and that losses are incurred upon the unwind of these derivatives. At this time, JANY would also enter the orderly wind-down phase in which the entity would begin selling assets. If losses incurred on the unwinding of derivatives and disposition of assets are greater than the capital held in the entity, third-party creditors would be made whole, or they would have a claim against Group Inc. pursuant to parent company transactional guarantees. In our projections, the parent company would have sufficient funding to make payments on behalf of JANY as contractually provided for. To be conservative, our Resolution Plan assumes JANY enters proceedings. We project that counterparties and creditors of the entity would not incur any losses and we believe JANY's entering proceedings would not have a systemic impact. Alternative options could be pursued, including a wind-down outside of proceedings.

Goldman Sachs Japan Co., Ltd.

| | |
|--------------------|--|
| Regulatory Status | <ul style="list-style-type: none"> • Regulated broker-dealer |
| Incorporation | <ul style="list-style-type: none"> • Kabushiki Kaisha (Joint Stock Company) incorporated in Japan |
| Primary Regulators | <ul style="list-style-type: none"> • Japan Financial Services Agency (JFSA) |
| Ownership | <ul style="list-style-type: none"> • Indirect, wholly-owned subsidiary of Group Inc. |
| Office Location | <ul style="list-style-type: none"> • Tokyo, Japan |
| Activities | <ul style="list-style-type: none"> • Investment banking • Securities and currencies trading and market making • Client base includes corporations, financial institutions and governments |
| Funding Sources | <ul style="list-style-type: none"> • Unsecured funding primarily from Group Inc. or Funding IHC • Secured borrowing from affiliates (primarily GSI and GS&Co.) |
| Other Matters | <ul style="list-style-type: none"> • Client assets are protected under the rules of the JFSA |

Summary of GSJCL's Resolution Strategy

The CLSA requires Funding IHC, both before and after a Group Inc. bankruptcy filing, to provide GSJCL with sufficient capital to meet its applicable capital requirements plus an operating buffer, and sufficient liquidity to meet its intraday liquidity requirements and prevent a payment default. Accordingly, under our preferred resolution strategy, GSJCL remains out of proceedings while it winds itself down in an orderly manner over time. After Group Inc. enters bankruptcy proceedings, GSJCL ceases to solicit new business, but it retains the operational functionality needed to dispose of its assets and hedge its remaining risk positions. Because of the steps we have taken, it continues to have access to both shared services and FMUs throughout the resolution process. This strategy prevents significant disruptions to clients holding cash or securities in accounts at GSJCL, and gives it the flexibility to execute asset sales and derivative unwinds at a pace that avoids fire-sales or the use of emergency government facilities.

We expect that clients of GSJCL would transfer their positions to alternate third-party providers. All securities inventory would be sold, and derivatives would be unwound either through early terminations, contractual maturities, portfolio sales, novations or bilateral terminations. After the market-making and client positions are wound down, GSJCL's balance sheet would largely be cash, financed by a combination of debt and equity. Our strategy is designed with the goal of having sufficient liquidity and capital to pay GSJCL's third-party creditors in full, with any remaining amounts ultimately returned to the bankruptcy estate of the parent company.

Goldman Sachs International Bank

| | |
|--------------------------|---|
| Regulatory Status | <ul style="list-style-type: none"> • U.K. registered bank |
| Incorporation | <ul style="list-style-type: none"> • Unlimited company incorporated in England and Wales |
| Primary Regulators | <ul style="list-style-type: none"> • Prudential Regulation Authority and Financial Conduct Authority |
| Ownership | <ul style="list-style-type: none"> • Indirect, wholly-owned subsidiary of Group Inc. |
| Office Location | <ul style="list-style-type: none"> • London, England |
| Activities | <ul style="list-style-type: none"> • Primary dealer for European government bonds • Lending and deposit taking |
| Funding Sources | <ul style="list-style-type: none"> • Deposit taking from third parties • Unsecured funding primarily from Funding IHC |
| Other Matters | <ul style="list-style-type: none"> • Client assets are protected under Financial Conduct Authority rules |

Summary of GSIB's Resolution Strategy

The CLSA requires Funding IHC, both before and after a Group Inc. bankruptcy filing, to provide GSIB with sufficient capital to meet its applicable capital requirements plus an operating buffer, and sufficient liquidity to meet its intraday liquidity requirements and prevent a payment default. Accordingly, under our preferred resolution strategy, GSIB remains out of proceedings while it winds itself down in an orderly manner over time. This will result in a better systemic outcome because GSIB will have flexibility to determine the optimal pace of asset sales and derivative unwinds, thereby avoiding fire-sales, disruptions for clients, and the use of emergency government facilities.

GSIB would sell all loans and securities inventory, and the limited derivatives held in the entity could be unwound either through early terminations, contractual maturities, portfolio sales, novations or bilateral terminations. Deposits would be repaid. After the lending activities are wound down and deposits repaid, GSIB's balance sheet would largely be cash, financed by a combination of debt and equity. Our strategy is designed with the goal of having sufficient liquidity and capital to pay GSIB's third-party creditors in full, with any remaining amounts ultimately returned to the bankruptcy estate of the parent company.

Goldman Sachs Asset Management, L.P.; Goldman Sachs Asset Management International

| | <u>GSAM</u> | <u>GSAMI</u> |
|-------------------|--|--|
| Regulatory Status | <ul style="list-style-type: none"> Registered as investment advisor with SEC¹⁸ | <ul style="list-style-type: none"> Authorized and regulated by Financial Conduct Authority |
| Incorporation | <ul style="list-style-type: none"> Limited partnership established in Delaware | <ul style="list-style-type: none"> Unlimited company incorporated in England |
| Ownership | <ul style="list-style-type: none"> Indirect, wholly-owned subsidiary of Group Inc. | <ul style="list-style-type: none"> Indirect, wholly-owned subsidiary of Group Inc. |
| Office Location | <ul style="list-style-type: none"> New York, NY | <ul style="list-style-type: none"> London, England |
| Activities | <ul style="list-style-type: none"> Asset management and investment advisor | <ul style="list-style-type: none"> Asset management and investment advisor |
| Funding Sources | <ul style="list-style-type: none"> Unsecured funding from Funding IHC | <ul style="list-style-type: none"> No material borrowing relationships with other material entities |
| Other Matters | <ul style="list-style-type: none"> Assets under management of \$663 billion | <ul style="list-style-type: none"> Assets under management of \$257 billion |

Summary of GSAM's and GSAMI's Resolution Strategy

Our asset management business, including GSAM and GSAMI, would be prepared for sale as part of our resolution strategy. These entities, which provide asset management services and offer investment products, have limited connectivity with other affiliates and limited obstacles that would hinder a sale in whole or in part.

We would not expect these entities to require additional capital or liquidity from the parent company or Funding IHC. However, the CLSA requires Funding IHC, both before and after a Group Inc. bankruptcy filing, to provide GSAM with sufficient capital to maintain positive equity and prevent a payment default, and to provide GSAMI with sufficient capital to meet its applicable capital requirements plus an operating buffer or prevent a payment default.

An alternative resolution approach would be to transfer the management of GSAM and GSAMI funds to other fund managers and wind these entities down in an orderly manner.

¹⁸ GSAM is also registered as a Commodity Pool Operator and Commodity Trading Advisor with the CFTC; in addition, it is registered with various Canadian regulators including the Ontario Securities Commission as a Non-Canadian Adviser (Investment Counsel and Portfolio Manager)

Goldman Sachs Funding LLC (Funding IHC)

| | |
|-------------------|---|
| Regulatory Status | <ul style="list-style-type: none"> • Not prudentially regulated |
| Incorporation | <ul style="list-style-type: none"> • Limited liability company incorporated in Delaware |
| Ownership | <ul style="list-style-type: none"> • Direct, wholly-owned subsidiary of Group Inc. |
| Office Location | <ul style="list-style-type: none"> • New York, NY |
| Activities | <ul style="list-style-type: none"> • Primary funding vehicle for Group Inc., certain material operating entities and the material service entities |
| Funding Sources | <ul style="list-style-type: none"> • Pursuant to the CLSA, Funding IHC receives unsecured funding from Group Inc. via the Funding Note |

Summary of Funding IHC's Resolution Strategy

Funding IHC was established in order to facilitate our preferred resolution strategy. We transferred to Funding IHC two types of assets that could be used to support material entities leading up to and following a Group Inc. bankruptcy filing: (i) Group Inc. GCLA and (ii) unsecured receivables that could be forgiven to recapitalize material entities (also referred to as internal TLAC). Forming Funding IHC and pre-funding it with these assets has two main benefits to our preferred resolution strategy. First, it provides incremental protection against potential creditor challenge to the provision of support of material entities leading up to a Group Inc. bankruptcy filing. Second, because Funding IHC would not enter resolution proceedings, it would have the flexibility to provide capital and liquidity support to material entities as and when needed following a Group Inc. bankruptcy filing.

Funding IHC is a party to the CLSA, which governs the relationship between Group Inc. and Funding IHC, and Funding IHC's obligation to provide capital and liquidity support to participating material entities during the runway leading up to and following Group Inc.'s bankruptcy filing. During business as usual and through a runway period, Funding IHC is required to provide liquidity to Group Inc. via the Revolver. During the runway, Funding IHC is also required to provide participating material entities with any capital required to meet their applicable regulatory requirements plus an operating buffer, and any liquidity required to maintain intraday liquidity requirements and prevent a payment failure. Upon the occurrence of a Resolution Trigger Event under the CLSA, (i) the Revolver automatically terminates, Group Inc. is obligated to use its available liquidity to repay outstanding amounts and, to the extent not repaid, outstanding amounts are automatically forgiven (ii) Group Inc. is required to make a final contribution of GCLA and intercompany receivables to Funding IHC, and (iii) the Funding Note is automatically forgiven. In addition, Funding IHC remains contractually obligated to provide the same level of support to participating material entities as during the runway.

Our runway and resolution triggers are designed to ensure that Funding IHC maintains sufficient capital and liquidity resources to support the orderly wind-down of our participating material entities in accordance with our preferred resolution strategy.

Other Material Service Entities

In addition to Funding IHC, the firm has designated the following eight entities as material service entities:

Goldman Sachs Services Private Ltd: GSSE is a Private Limited Company domiciled in India and wholly owned indirectly by Group Inc. The entity operates from its office location in Bengaluru, India. GSSE is a staffing service entity employing predominantly technology and operational support employees, and it also owns facilities assets. It provides operational support services to material operating entities under a master services agreement. The entity earns revenue by charging its operating costs to operating entities with a mark-up, as applicable.

Goldman Sachs Services LLC: GSPW is a Limited Liability Company domiciled in Delaware and wholly owned indirectly by Group Inc. It operates primarily from its offices in New Jersey, New York and Utah. GSPW is a staffing service entity employing primarily technology and operational support employees and providing operational support services to material operating entities under a master services agreement. The entity earns revenue by charging its operating costs to operating entities with a mark-up, as applicable.

Goldman Sachs Property Management: GSPM is a Private Unlimited Company domiciled in England and wholly owned indirectly by Group Inc. It operates from its office location in London. GSPM is a property management company that provides operating entities with access to the technology assets that it owns. The entity earns revenue by charging its operating costs to operating entities with a mark-up, as applicable.

Goldman Sachs Property Management USA LLC: GPMU is a Limited Liability Company, domiciled in Delaware and wholly owned indirectly by Group Inc. It operates from its office location in New Jersey. GPMU is a property management company that provides operating entities with access to the technology assets (e.g. data servers, computer equipment, etc.) that it owns. The entity earns revenue by charging its operating costs to operating entities with a mark-up, as applicable.

Goldman Sachs Services (Asia) Limited: GHKL is a Private Limited Company domiciled in Hong Kong and wholly owned indirectly by Group Inc. It operates from its office location in Hong Kong. GHKL is a staffing service entity that employs primarily technology and operational support employees and provides operational support services to material operating entities under a master services agreement; it is also a property management company that provides operating entities with access to the technology and facilities assets that it owns. The entity earns revenue by charging its operating costs to operating entities with a mark-up, as applicable.

Goldman Sachs Services (Singapore) Pte. Ltd.: GPMS is a Private Limited Company domiciled in Singapore and wholly owned indirectly by Group Inc. It operates from its office location in Singapore. GPMS is a staffing service entity that employs primarily technology and operational support employees and provides operational support services to material operating entities under a master services agreement; it is also a property management company that provides operating

entities with access to the technology assets that it owns. The entity earns revenue by charging its operating costs to operating entities with a mark-up, as applicable.

Goldman Sachs (UK) Svc. Limited: GSUL is a Private Limited Company domiciled in England and wholly owned indirectly by Group Inc. It operates from its office location in London. GSUL is a staffing service entity employing primarily technology and operational support employees and provides operational support services to material operating entities under a master services agreement. The entity earns revenue by charging its operating costs to operating entities with a mark-up, as applicable.

Goldman Sachs Japan Services Co., Ltd.: GSJS is a Kabushiki Kaisha Company domiciled in Japan and wholly owned indirectly by Group Inc. The entity operates from its office location in Tokyo. GSJS is a staffing service entity that employs primarily technology support employees, and provides operational support services to material operating entities under a master services agreement; it is also a property management company that provides operating entities with access to the technology assets that it owns. The entity earns revenue by charging its operating costs to operating entities with a mark-up, as applicable.

Summary of Resolution Strategy for the Firm's Material Service Entities

We would not expect any of these eight material service entities to require additional capital or liquidity from either the parent company or Funding IHC: this is because we maintain six months' working capital at each of them, and because the SLAs require these entities to be paid in a timely manner for services they provide to material operating entities. Nevertheless, the CLSA requires Funding IHC, both before and after a Group Inc. bankruptcy filing, to provide these material service entities with sufficient capital or liquidity to maintain positive equity and prevent a payment default. As the material operating entities gradually unwind their positions, the material service entities will reduce their corresponding level of support. Under our preferred resolution strategy, our material service entities remain in operation during the wind-down period: they have sufficient liquidity to pay their creditors in full. Once their services are no longer required, they are wound down and any cash that remains on their balance sheet is returned to the parent company's bankruptcy estate.

SI 3. Summary Financial Information: Assets, Liabilities, Capital and Funding

Set out on the following pages is financial information extracted from our 2018 Form 10-K.

Please see Part II, Items 7 and 8 of our 2018 Form 10-K for management's discussion and analysis of financial condition and results of operations and the notes to these consolidated financial statements, respectively.

2019 RESOLUTION PLAN



- Set forth below are the consolidated statements of earnings from our 2018 Form 10-K¹⁹:

| <i>in millions, except per share amounts</i> | Year Ended December | | |
|---|---------------------|-----------------|-----------------|
| | 2018 | 2017 | 2016 |
| Revenues | | | |
| Investment banking | \$ 7,862 | \$ 7,371 | \$ 6,273 |
| Investment management | 6,514 | 5,803 | 5,407 |
| Commissions and fees | 3,199 | 3,051 | 3,208 |
| Market making | 9,451 | 7,660 | 9,933 |
| Other principal transactions | 5,823 | 5,913 | 3,382 |
| Total non-interest revenues | 32,849 | 29,798 | 28,203 |
| Interest income | 19,679 | 13,113 | 9,691 |
| Interest expense | 15,912 | 10,181 | 7,104 |
| Net interest income | 3,767 | 2,932 | 2,587 |
| Total net revenues | 36,616 | 32,730 | 30,790 |
| Provision for credit losses | 674 | 657 | 182 |
| Operating expenses | | | |
| Compensation and benefits | 12,328 | 11,653 | 11,448 |
| Brokerage, clearing, exchange and distribution fees | 3,200 | 2,876 | 2,823 |
| Market development | 740 | 588 | 457 |
| Communications and technology | 1,023 | 897 | 809 |
| Depreciation and amortization | 1,328 | 1,152 | 998 |
| Occupancy | 809 | 733 | 788 |
| Professional fees | 1,214 | 1,165 | 1,081 |
| Other expenses | 2,819 | 1,877 | 1,900 |
| Total operating expenses | 23,461 | 20,941 | 20,304 |
| Pre-tax earnings | 12,481 | 11,132 | 10,304 |
| Provision for taxes | 2,022 | 6,846 | 2,906 |
| Net earnings | 10,459 | 4,286 | 7,398 |
| Preferred stock dividends | 599 | 601 | 311 |
| Net earnings applicable to common shareholders | \$ 9,860 | \$ 3,685 | \$ 7,087 |
| Earnings per common share | | | |
| Basic | \$ 25.53 | \$ 9.12 | \$ 16.53 |
| Diluted | \$ 25.27 | \$ 9.01 | \$ 16.29 |
| Average common shares | | | |
| Basic | 385.4 | 401.6 | 427.4 |
| Diluted | 390.2 | 409.1 | 435.1 |

¹⁹ The notes accompanying our consolidated financial statements in our 2018 Form 10-K are an integral part of our consolidated financial statements.

2019 RESOLUTION PLAN

- Set forth below are the consolidated statements of financial condition from our 2018 Form 10-K²⁰:

| <i>\$ in millions</i> | As of December | |
|---|------------------|------------------|
| | 2018 | 2017 |
| Assets | | |
| Cash and cash equivalents | \$130,547 | \$110,051 |
| Collateralized agreements: | | |
| Securities purchased under agreements to resell (includes \$139,220 and \$120,420 at fair value) | 139,258 | 120,822 |
| Securities borrowed (includes \$23,142 and \$78,189 at fair value) | 135,285 | 190,848 |
| Receivables: | | |
| Loans receivable | 80,590 | 65,933 |
| Customer and other receivables (includes \$3,189 and \$3,526 at fair value) | 79,315 | 84,788 |
| Financial instruments owned (at fair value and includes \$55,081 and \$50,335 pledged as collateral) | 336,161 | 315,988 |
| Other assets | 30,640 | 28,346 |
| Total assets | \$931,796 | \$916,776 |
| Liabilities and shareholders' equity | | |
| Deposits (includes \$21,060 and \$22,902 at fair value) | \$158,257 | \$138,604 |
| Collateralized financings: | | |
| Securities sold under agreements to repurchase (at fair value) | 78,723 | 84,718 |
| Securities loaned (includes \$3,241 and \$5,357 at fair value) | 11,808 | 14,793 |
| Other secured financings (includes \$20,904 and \$24,345 at fair value) | 21,433 | 24,788 |
| Customer and other payables | 180,235 | 178,169 |
| Financial instruments sold, but not yet purchased (at fair value) | 108,897 | 111,930 |
| Unsecured short-term borrowings (includes \$16,963 and \$16,904 at fair value) | 40,502 | 46,922 |
| Unsecured long-term borrowings (includes \$46,584 and \$38,638 at fair value) | 224,149 | 217,687 |
| Other liabilities (includes \$132 and \$268 at fair value) | 17,607 | 16,922 |
| Total liabilities | \$41,611 | \$34,533 |
| Commitments, contingencies and guarantees | | |
| Shareholders' equity | | |
| Preferred stock; aggregate liquidation preference of \$11,203 and \$11,853 | 11,203 | 11,853 |
| Common stock; 891,356,284 and 884,592,863 shares issued, and 367,741,973 and 374,808,805 shares outstanding | 9 | 9 |
| Share-based awards | 2,845 | 2,777 |
| Nonvoting common stock; no shares issued and outstanding | — | — |
| Additional paid-in capital | 54,005 | 53,357 |
| Retained earnings | 100,100 | 91,519 |
| Accumulated other comprehensive income/(loss) | 693 | (1,880) |
| Stock held in treasury, at cost; 523,614,313 and 509,784,060 shares | (78,670) | (75,392) |
| Total shareholders' equity | 90,185 | 82,243 |
| Total liabilities and shareholders' equity | \$931,796 | \$916,776 |

²⁰ The notes accompanying our consolidated financial statements in our 2018 Form 10-K are an integral part of our consolidated financial statements.

Equity Capital Management

We determine the appropriate amount and composition of our equity capital by considering multiple factors including our current and future regulatory capital requirements, the results of our capital planning and stress testing process, the results of resolution capital models and other factors, such as rating agency guidelines, subsidiary capital requirements, the business environment and conditions in the financial markets.

We manage our capital requirements and the levels of our capital usage principally by setting limits on balance sheet assets and/or limits on risk, in each case at both the firmwide and business levels.

We principally manage the level and composition of our equity capital through issuances and repurchases of our common stock. We may also, from time to time, issue or repurchase our preferred stock, junior subordinated debt issued to trusts, and other subordinated debt or other forms of capital as business conditions warrant. Prior to any repurchases, we must receive confirmation that the Federal Reserve does not object to such capital action.

Consolidated Regulatory Capital

As a bank holding company, the firm is subject to consolidated regulatory capital requirements which are calculated in accordance with the regulations of the Federal Reserve (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 could result in restrictions being imposed by the firm's regulators and could limit the firm's ability to distribute capital, including share repurchases and dividend payments, and to 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. Furthermore, certain of the firm's subsidiaries are subject to separate regulations and capital requirements.

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 Dodd-Frank Act. Under the Capital Framework, the firm is an "Advanced approach" banking organization and has been designated as a global systemically important bank (G-SIB).

The capital requirements calculated in accordance with the Capital Framework include the minimum risk-based capital and leverage ratios. In addition, the risk-based capital requirements include the capital conservation buffer, countercyclical capital buffer and the G-SIB surcharge, all of which 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 (i) the Standardized approach and market risk rules set out in the Capital Framework (together, the

Standardized Capital Rules) and (ii) the Advanced approach and market risk rules set out in the Capital Framework (together, the Basel III Advanced Rules). The lower of each risk-based capital ratio calculated in (i) and (ii) is the ratio against which the firm's compliance with its risk-based capital requirements is assessed. 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.

Consolidated Regulatory Risk-Based Capital and Leverage Ratios

The table below presents the risk-based capital and leverage requirements.

| | As of December | |
|--|----------------|-------|
| | 2018 | 2017 |
| Risk-based capital requirements | | |
| CET1 capital ratio | 8.3% | 7.0% |
| Tier 1 capital ratio | 9.8% | 8.5% |
| Total capital ratio | 11.8% | 10.5% |
| Leverage requirements | | |
| Tier 1 leverage ratio | 4.0% | 4.0% |
| SLR | 5.0% | N/A |

In the table above:

- As of December 2018, the CET1 capital ratio requirement included a minimum of 4.5%, the Tier 1 capital ratio requirement included a minimum of 6.0%, and the Total capital ratio requirement included a minimum of 8.0%. The requirements also included the 75% phase-in of the capital conservation buffer of 2.5%, the 75% phase-in of the G-SIB surcharge of 2.5% (Method 2) and the countercyclical capital buffer, which the FRB has set to zero percent.
- As of December 2017, the CET1 capital ratio requirement included a minimum of 4.5%, the Tier 1 capital ratio requirement included a minimum of 6.0%, and the Total capital ratio requirement included a minimum of 8.0%. The requirements also included the 50% phase-in of the capital conservation buffer of 2.5%, the 50% phase-in of the G-SIB surcharge of 2.5% (Method 2) and the countercyclical capital buffer, which the FRB has set to zero percent.
- The capital conservation buffer, countercyclical capital buffer and G-SIB surcharge began to phase in ratably on January 1, 2016, and became fully effective on January 1, 2019.
- 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 must be 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 upon 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% as of December 2018 includes a minimum of 3% and a 2% buffer applicable to G-SIBs.

2019 RESOLUTION PLAN

The table below presents information about the risk-based capital ratios.

| <i>\$ in millions</i> | Standardized | | Basel III Advanced | |
|----------------------------|--------------|---------|-----------------------|---------|
| As of December 2018 | | | | |
| CET1 capital | \$ | 73,116 | \$ | 73,116 |
| Tier 1 capital | \$ | 83,702 | \$ | 83,702 |
| Tier 2 capital | \$ | 14,926 | \$ | 13,743 |
| Total capital | \$ | 98,628 | \$ | 97,445 |
| RWAs | \$ | 547,910 | \$ | 558,111 |
| <hr/> | | | | |
| CET1 capital ratio | | 13.3% | | 13.1% |
| Tier 1 capital ratio | | 15.3% | | 15.0% |
| Total capital ratio | | 18.0% | | 17.5% |
| <hr/> | | | | |
| As of December 2017 | | | | |
| CET1 capital | \$ | 67,110 | \$ | 67,110 |
| Tier 1 capital | \$ | 78,331 | \$ | 78,331 |
| Tier 2 capital | \$ | 14,977 | \$ | 13,899 |
| Total capital | \$ | 93,308 | \$ | 92,230 |
| RWAs | \$ | 555,611 | \$ | 617,646 |
| <hr/> | | | | |
| CET1 capital ratio | | 12.1% | | 10.9% |
| Tier 1 capital ratio | | 14.1% | | 12.7% |
| Total capital ratio | | 16.8% | | 14.9% |

In the table above, each of the risk-based capital ratios calculated in accordance with the Basel III Advanced Rules was lower than that calculated in accordance with the Standardized Capital Rules and therefore the Basel III Advanced ratios were the ratios that applied to the firm as of both December 2018 and December 2017.

The table below presents information about the leverage ratios.

| <i>\$ in millions</i> | For the Three Months Ended or as of December | |
|--------------------------------|---|--------------------|
| | 2018 | 2017 |
| Tier 1 capital | \$ 83,702 | \$ 78,331 |
| Average total assets | 945,961 | 937,424 |
| Deductions from Tier 1 capital | (4,754) | (4,508) |
| Average adjusted total assets | 941,207 | 932,916 |
| Off-balance-sheet exposures | 401,699 | 408,164 |
| Total leverage exposure | \$1,342,906 | \$1,341,080 |
| <hr/> | | |
| Tier 1 leverage ratio | 8.9% | 8.4% |
| SLR | 6.2% | 5.8% |

In the table above:

- Average total assets represents the daily average assets for the quarter.
- Off-balance-sheet exposures represents the monthly average and consists of derivatives, securities financing transactions, commitments and guarantees.
- Tier 1 leverage ratio is calculated as Tier 1 capital divided by average adjusted total assets.
- SLR is calculated as Tier 1 capital divided by total leverage exposure.

Risk-based Capital. The table below presents information about risk-based capital.

| <i>\$ in millions</i> | As of December | |
|--|------------------|------------------|
| | 2018 | 2017 |
| Common shareholders' equity | \$ 78,982 | \$ 70,390 |
| Deduction for goodwill | (3,097) | (3,011) |
| Deduction for identifiable intangible assets | (297) | (258) |
| Other adjustments | (2,472) | (11) |
| CET1 capital | 73,116 | 67,110 |
| Preferred stock | 11,203 | 11,853 |
| Deduction for investments in covered funds | (615) | (590) |
| Other adjustments | (2) | (42) |
| Tier 1 capital | \$ 83,702 | \$ 78,331 |
| Standardized Tier 2 and Total capital | | |
| Tier 1 capital | \$ 83,702 | \$ 78,331 |
| Qualifying subordinated debt | 13,147 | 13,360 |
| Junior subordinated debt | 442 | 567 |
| Allowance for credit losses | 1,353 | 1,078 |
| Other adjustments | (16) | (28) |
| Standardized Tier 2 capital | 14,926 | 14,977 |
| Standardized Total capital | \$ 98,628 | \$ 93,308 |
| Basel III Advanced Tier 2 and Total capital | | |
| Tier 1 capital | \$ 83,702 | \$ 78,331 |
| Standardized Tier 2 capital | 14,926 | 14,977 |
| Allowance for credit losses | (1,353) | (1,078) |
| Other adjustments | 170 | – |
| Basel III Advanced Tier 2 capital | 13,743 | 13,899 |
| Basel III Advanced Total capital | \$ 97,445 | \$ 92,230 |

In the table above:

- Deduction for goodwill was net of deferred tax liabilities of \$661 million as of December 2018 and \$654 million as of December 2017.
- Deduction for identifiable intangible assets was net of deferred tax liabilities of \$27 million as of December 2018 and \$40 million as of December 2017. The deduction for identifiable intangible assets was fully phased into CET1 in January 2018. As of December 2017, CET1 reflects 80% of the identifiable intangible assets deduction and the remaining 20% was risk weighted.
- Deduction for investments in covered funds represents the firm's aggregate investments in applicable Volcker Rule covered funds, excluding investments that are subject to an extended conformance period.
- Other adjustments within CET1 capital and Tier 1 capital primarily include credit valuation adjustments on derivative liabilities, pension and postretirement 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. The deduction for such items was fully phased into CET1 in January 2018. As of December 2017, CET1 reflects 80% of such deduction. Substantially all of the balance that was not deducted from CET1 as of December 2017 was deducted from Tier 1 capital within other adjustments. Other adjustments within Basel III Advanced 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 represents debt issued to Trust. As of December 2018, 40% of this debt was included in Tier 2 capital and 60% was fully phased out of regulatory capital. As of December 2017, 50% of this debt was included in Tier 2 capital and 50% was fully phased out of regulatory capital. Junior subordinated debt is reduced by the amount of Trust Preferred Securities purchased by the firm and will be fully phased out of Tier 2 capital by 2022 at a rate of 10% per year.

Risk-Weighted Assets. RWAs are calculated in accordance with both the Standardized Capital Rules and the Basel III Advanced Rules.

Credit Risk

Credit RWAs are calculated based upon measures of exposure, which are then risk weighted under the Standardized Capital Rules and Basel III Advanced Rules:

- The Standardized Capital Rules apply prescribed risk-weights, which depend largely on the type of counterparty. The exposure measure for derivatives and securities financing transactions are based on specific formulas which take certain factors into consideration.
- Under the Basel III Advanced Rules, the firm computes risk-weights for wholesale and retail credit exposures in accordance with the Advanced Internal Ratings-Based approach. The exposure measures for derivatives and securities financing transactions are computed utilizing internal models.
- For both Standardized and Basel III Advanced credit RWAs, the risk-weights for securitizations and equities are based on specific required formulaic approaches.

Market Risk

RWAs for market risk in accordance with the Standardized Capital Rules and the Basel III Advanced Rules are generally consistent. Market RWAs are calculated based on measures of exposure which include the following:

- Value-at-Risk (VaR) is the potential loss in value of inventory positions, as well as certain other financial assets and financial liabilities, due to adverse market movements over a defined time horizon with a specified confidence level.

For both risk management purposes and regulatory capital calculations the firm uses a single VaR model which captures risks including those related to interest rates, equity prices, currency rates and commodity prices. However, VaR used for regulatory capital requirements (regulatory VaR) differs from risk management VaR due to different time horizons and confidence levels (10-day and 99% for regulatory VaR vs. one-day and 95% for risk management VaR), as well as differences in the scope of positions on which VaR is calculated. 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 FRB's regulatory capital rules require 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. The firm's positional losses observed on a single day exceeded its 99% one-day regulatory VaR on two occasions during 2018 and did not exceed its 99% one-day regulatory VaR during 2017. There was no change in the VaR multiplier used to calculate Market RWAs;

- Stressed VaR is the potential loss in value of inventory positions, as well as certain other financial assets and financial liabilities, during a period of significant market stress;
- Incremental risk is the potential loss in value of non-securitized inventory positions due to the default or credit migration of issuers of financial instruments over a one-year time horizon;
- Comprehensive risk is the potential loss in value, due to price risk and defaults, within the firm's credit correlation positions; and
- 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 standardized measurement method is used to determine specific risk RWAs, by applying supervisory defined risk-weighting factors after applicable netting is performed.

Operational Risk

Operational RWAs are only required to be included under the Basel III Advanced Rules. The firm utilizes an internal risk-based model to quantify Operational RWAs.

Liquidity Risk Management

Overview

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.

Treasury, which reports to our chief financial officer, has primary responsibility for developing, managing and executing our liquidity and funding strategy within our risk appetite.

Liquidity Risk, which is independent of our revenue-producing units and Treasury, and reports to our chief risk officer, has primary responsibility for assessing, monitoring and managing our liquidity risk through firmwide oversight across our global businesses and the establishment of stress testing and limits frameworks.

Liquidity Risk Management Principles

We manage liquidity risk according to three principles: (i) hold sufficient excess liquidity in the form of GCLA to cover outflows during a stressed period, (ii) maintain appropriate Asset-Liability Management and (iii) maintain a viable Contingency Funding Plan.

GCLA. GCLA is liquidity that we maintain to meet a broad range of potential cash outflows and collateral needs in a stressed environment. A primary liquidity principle is to pre-fund our estimated potential cash and collateral needs during a liquidity crisis and hold this liquidity in the form of unencumbered, highly liquid securities and cash. We believe that the securities held in our GCLA would be readily convertible to cash in a matter of days, through liquidation, by entering into repurchase agreements or from maturities of resale agreements, and that this cash would allow us to meet immediate obligations without needing to sell other assets or depend on additional funding from credit-sensitive markets.

Our GCLA reflects the following principles:

- The first days or weeks of a liquidity crisis are the most critical to a company's survival;
- Focus must be maintained on all potential cash and collateral outflows, not just disruptions to financing flows. Our businesses are diverse, and our liquidity needs are determined by many factors, including market movements, collateral requirements and client commitments, all of which can change dramatically in a difficult funding environment;
- During a liquidity crisis, credit-sensitive funding, including unsecured debt, certain deposits and some types of secured financing agreements, may be unavailable, and the terms (e.g., interest rates, collateral provisions and tenor) or availability of other types of secured financing may change and certain deposits may be withdrawn; and
- As a result of our policy to pre-fund liquidity that we estimate may be needed in a crisis, we hold more unencumbered securities and have larger debt balances than our businesses

would otherwise require. We believe that our liquidity is stronger with greater balances of highly liquid unencumbered securities, even though it increases our total assets and our funding costs.

We maintain our GCLA across Group Inc., Funding IHC and material operating entities, asset types, and FMUs to provide us with sufficient operating liquidity to ensure timely settlement in all major markets, even in a difficult funding environment. In addition to the GCLA, we maintain cash balances and securities in several of our other entities, primarily for use in specific currencies, entities or jurisdictions where we do not have immediate access to parent company liquidity.

We believe that our GCLA provides us with a resilient source of funds that would be available in advance of potential cash and collateral outflows and gives us significant flexibility in managing through a difficult funding environment.

Asset-Liability Management. Our liquidity risk management policies are designed to ensure we have a sufficient amount of financing, even when funding markets experience persistent stress. We manage the maturities and diversity of our funding across markets, products and counterparties, and seek to maintain a diversified funding profile with an appropriate tenor, taking into consideration the characteristics and liquidity profile of our assets.

Our approach to asset-liability management includes:

- Conservatively managing the overall characteristics of our funding book, with a focus on maintaining long-term, diversified sources of funding in excess of our current requirements;
- Actively managing and monitoring our asset base, with particular focus on the liquidity, holding period and our ability to fund assets on a secured basis. We assess our funding requirements and our ability to liquidate assets in a stressed environment while appropriately managing risk. This enables us to determine the most appropriate funding products and tenors; and
- Raising secured and unsecured financing that has a long tenor relative to the liquidity profile of our assets. This reduces the risk that our liabilities will come due in advance of our ability to generate liquidity from the sale of our assets. Because we maintain a highly liquid balance sheet, the holding period of certain of our assets may be materially shorter than their contractual maturity dates.

Our goal is to ensure that we maintain sufficient liquidity to fund our assets and meet our contractual and contingent obligations in normal times, as well as during periods of market stress. Through our dynamic balance sheet management process, we use actual and projected asset balances to determine secured and unsecured funding requirements. Funding plans are reviewed and approved by the Firmwide Asset Liability Committee. In addition, our independent risk oversight and control functions analyze, and the Firmwide Asset Liability Committee reviews, our consolidated total capital position (unsecured long-term borrowings plus total shareholders' equity) so that we maintain a level of long-term funding that is sufficient to meet our long-term financing requirements. In a liquidity crisis, we would first use our GCLA in order to avoid reliance on asset

sales (other than our GCLA). However, we recognize that orderly asset sales may be prudent or necessary in a severe or persistent liquidity crisis.

Contingency Funding Plan. We maintain a contingency funding plan to provide a framework for analyzing and responding to a liquidity crisis situation or periods of market stress.

Our contingency funding plan outlines a list of potential risk factors, key reports and metrics that are reviewed on an ongoing basis to assist in assessing the severity of, and managing through, a liquidity crisis and/or market dislocation. The contingency funding plan also describes in detail our potential responses if our assessments indicate that we have entered a liquidity crisis, which include pre-funding for what we estimate will be our potential cash and collateral needs, as well as utilizing secondary sources of liquidity. Mitigants and action items to address specific risks which may arise are also described and assigned to individuals responsible for execution.

The contingency funding plan identifies key groups of individuals to foster effective coordination, control and distribution of information, all of which are critical in the management of a crisis or period of market stress. The contingency funding plan also provides information about the responsibilities of these groups and individuals, which include making and disseminating key decisions, coordinating all contingency activities throughout the duration of the crisis or period of market stress, implementing liquidity maintenance activities and managing internal and external communication.

Stress Tests

In order to determine the appropriate size of our GCLA, we use an internal liquidity model, referred to as the Modeled Liquidity Outflow, which captures and quantifies our liquidity risks. We also consider other factors, including, but not limited to, an assessment of our potential intraday liquidity needs through an additional internal liquidity model, referred to as the Intraday Liquidity Model, the results of our long-term stress testing models, our resolution liquidity models and other applicable regulatory requirements and a qualitative assessment of our condition, as well as the financial markets. The results of the Modeled Liquidity Outflow, the Intraday Liquidity Model, the long-term stress testing models and the resolution liquidity models are reported to senior management on a regular basis. We also perform stress tests that are designed to ensure a comprehensive analysis of our vulnerabilities and idiosyncratic risks combining financial and nonfinancial risks, including, but not limited to, credit, market, liquidity and funding, operational and compliance, strategic, systemic and emerging risks into a single combined scenario.

Modeled Liquidity Outflow. Our Modeled Liquidity Outflow is based on conducting multiple scenarios that include combinations of market-wide and firm-specific stress. These scenarios are characterized by the following qualitative elements:

- Severely challenged market environments, including low consumer and corporate confidence, financial and political instability, adverse changes in market values, including potential declines in equity markets and widening of credit spreads; and
- A firm-specific crisis potentially triggered by material losses, reputational damage, litigation, executive departure, and/or a ratings downgrade.

The following are key modeling elements of the Modeled Liquidity Outflow:

- Liquidity needs over a 30-day scenario;
- A two-notch downgrade of our long-term senior unsecured credit ratings;
- A combination of contractual outflows, such as upcoming maturities of unsecured debt, and contingent outflows (e.g., actions, though not contractually required, we may deem necessary in a crisis). We assume that most contingent outflows will occur within the initial days and weeks of a crisis;
- No issuance of equity or unsecured debt;
- No support from additional government funding facilities. Although we have access to various central bank funding programs, we do not assume reliance on additional sources of funding in a liquidity crisis; and
- No asset liquidation except relating to GCLA or hedging activities.

The potential contractual and contingent cash and collateral outflows covered in our Modeled Liquidity Outflow include:

Unsecured Funding

- Contractual: All upcoming maturities of unsecured long-term debt, commercial paper and other unsecured funding products. We assume that we will be unable to issue new unsecured debt or roll over any maturing debt.
- Contingent: Repurchases of our outstanding long-term debt, commercial paper and hybrid financial instruments in the ordinary course of business as a market maker.

Deposits

- Contractual: All upcoming maturities of term deposits. We assume that we will be unable to raise new term deposits or roll over any maturing term deposits.
- Contingent: Partial withdrawals of deposits that have no contractual maturity. The withdrawal assumptions reflect, among other factors, the type of deposit, whether the deposit is insured or uninsured, and our relationship with the depositor.

Secured Funding

- Contractual: A portion of upcoming contractual maturities of secured funding due to either the inability to refinance or the ability to refinance only at wider haircuts (i.e., on terms which require us to post additional collateral). Our assumptions reflect, among other factors, the quality of the underlying collateral, counterparty roll probabilities (our assessment of the counterparty's likelihood of continuing to provide funding on a secured basis at the maturity of the trade) and counterparty concentration.
- Contingent: Adverse changes in the value of financial assets pledged as collateral for financing transactions, which would necessitate additional collateral postings under those transactions.

OTC Derivatives

- Contingent: Collateral postings to counterparties due to adverse changes in the value of our OTC derivatives, excluding those that are cleared and settled through central counterparties (OTC-cleared).
- Contingent: Other outflows of cash or collateral related to OTC derivatives, excluding OTC-cleared, including the impact of trade terminations, collateral substitutions, collateral disputes, loss of rehypothecation rights, collateral calls or termination payments required by a two-notch downgrade in our credit ratings, and collateral that has not been called by counterparties, but is available to them.

Exchange-Traded and OTC-cleared Derivatives

- Contingent: Variation margin postings required due to adverse changes in the value of our outstanding exchange-traded and OTC-cleared derivatives.
- Contingent: An increase in initial margin and guaranty fund requirements by derivative clearing houses.

Customer Cash and Securities

- Contingent: Liquidity outflows associated with our prime brokerage business, including withdrawals of customer credit balances, and a reduction in customer short positions, which may serve as a funding source for long positions.

Securities

- Contingent: Liquidity outflows associated with a reduction or composition change in our short positions, which may serve as a funding source for long positions.

Unfunded Commitments

- Contingent: Draws on our unfunded commitments. Draw assumptions reflect, among other things, the type of commitment and counterparty.

Other

- Other large cash outflows that could occur in a stressed environment.

Intraday Liquidity Model. Our Intraday Liquidity Model measures our intraday liquidity needs using a scenario analysis characterized by the same qualitative elements as our Modeled Liquidity Outflow. The model assesses the risk of increased intraday liquidity requirements during a scenario where access to sources of intraday liquidity may become constrained.

The following are key modeling elements of the Intraday Liquidity Model:

- Liquidity needs over a one-day settlement period;
- Delays in receipt of counterparty cash payments;
- A reduction in the availability of intraday credit lines at FMUs; and
- Higher settlement volumes due to an increase in activity.

GCLA and Unencumbered Metrics

GCLA. We strictly limit our GCLA to a narrowly defined list of securities and cash because they are highly liquid, even in a difficult funding environment. We do not include other potential sources of excess liquidity in our GCLA, such as less liquid unencumbered securities or committed credit facilities. The table below presents information about our average GCLA.

| <i>\$ in millions</i> | Average for the Year Ended December | |
|----------------------------------|--|------------------|
| | 2018 | 2017 |
| Denomination | | |
| U.S. dollar | \$155,348 | \$155,020 |
| Non-U.S. dollar | 77,995 | 63,528 |
| Total | \$233,343 | \$218,548 |
| Asset Class | | |
| Overnight cash deposits | \$ 98,811 | \$ 93,617 |
| U.S. government obligations | 79,810 | 75,108 |
| U.S. agency obligations | 12,171 | 11,813 |
| Non-U.S. government obligations | 42,551 | 38,010 |
| Total | \$233,343 | \$218,548 |
| Entity Type | | |
| Group Inc. and Funding IHC | \$ 40,920 | \$ 37,507 |
| Major broker-dealer subsidiaries | 104,364 | 98,160 |
| Major bank subsidiaries | 88,059 | 82,881 |
| Total | \$233,343 | \$218,548 |

In the table above:

- The U.S. dollar-denominated GCLA consists of (i) unencumbered U.S. government and agency obligations (including highly liquid U.S. agency mortgage-backed obligations), all of which are eligible as collateral in Federal Reserve open market operations and (ii) certain overnight U.S. dollar cash deposits.
- The non-U.S. dollar-denominated GCLA consists of non-U.S. government obligations (only unencumbered German, French, Japanese and U.K. government obligations) and certain overnight cash deposits in highly liquid currencies.

We maintain our GCLA to enable us to meet current and potential liquidity requirements of our parent company, Group Inc., and its subsidiaries. Our Modeled Liquidity Outflow and Intraday Liquidity Model incorporate a consolidated requirement for Group Inc., as well as a standalone requirement for each material operating entity. Funding IHC is required to provide the necessary liquidity to Group Inc. during the ordinary course of business, and is also obligated to provide capital and liquidity support to material operating entities in the event of our material financial distress or failure. Liquidity held directly in each of our material operating entities is intended for use only by that entity to meet its liquidity requirements and is assumed not to be available to Group Inc. or Funding IHC unless (i) legally provided for and (ii) there are no additional regulatory, tax or other restrictions. In addition, the Modeled Liquidity Outflow and Intraday Liquidity Model also incorporate a broader assessment of standalone liquidity requirements for other subsidiaries and we hold a portion of our GCLA directly at Group Inc. or Funding IHC to support such requirements.

Note that a large portion of the GCLA previously held at Group Inc. is now held at Funding IHC.

Other Unencumbered Assets. In addition to our GCLA, we have a significant amount of other unencumbered cash and financial instruments, including other government obligations, high-grade money market securities, corporate obligations, marginable equities, loans and cash deposits not included in our GCLA. The fair value of our unencumbered assets averaged \$177.08 billion for 2018 and \$158.41 billion for 2017. We do not consider these assets liquid enough to be eligible for our GCLA.

Liquidity Regulatory Framework

As a bank holding company, we are subject to a minimum Liquidity Coverage Ratio (LCR) under the LCR rule approved by the U.S. federal bank regulatory agencies. The LCR rule requires organizations to maintain an adequate ratio of eligible high-quality liquid assets (HQLA) to expected net cash outflows under an acute short-term liquidity stress scenario. Eligible HQLA excludes HQLA held by subsidiaries that is in excess of their minimum requirement and is subject to transfer restrictions. We are required to maintain a minimum LCR of 100%. We expect that fluctuations in client activity, business mix and the market environment will impact our average LCR.

The table below presents information about our average daily LCR.

| <i>\$ in millions</i> | Average for the Three Months Ended | |
|-----------------------|---------------------------------------|-------------------|
| | December 2018 | September 2018 |
| Total HQLA | \$226,473 | \$233,721 |
| Eligible HQLA | \$160,016 | \$170,621 |
| Net cash outflows | \$126,511 | \$133,126 |
| LCR | 127% | 128% |

In addition, the U.S. federal bank regulatory agencies have issued a proposed rule that calls for a net stable funding ratio (NSFR) for large U.S. banking organizations. The proposal would require banking organizations to ensure they have access to stable funding over a one-year time horizon. The proposed rule includes quarterly disclosure of the ratio and a description of the banking organization's stable funding sources. The U.S. federal bank regulatory agencies have not released the final rule. We expect that we will be compliant with the NSFR requirement when it is effective.

The following is information about our subsidiary liquidity regulatory requirements:

- **GS Bank.** GS Bank is subject to a minimum LCR of 100% under the LCR rule approved by the U.S. federal bank regulatory agencies. As of December 2018, GS Bank's LCR exceeded the minimum requirement. The NSFR requirement described above would also apply to GS Bank.
- **GSI.** GSI is subject to a minimum LCR of 100% under the LCR rule approved by the U.K. regulatory authorities and the European Commission. GSI's average monthly LCR for the trailing twelve-month period ended December 2018 exceeded the minimum requirement.

- Other Subsidiaries.** We monitor local regulatory liquidity requirements of our subsidiaries to ensure compliance. For many of our subsidiaries, these requirements either have changed or are likely to change in the future due to the implementation of the Basel Committee's framework for liquidity risk measurement, standards and monitoring, as well as other regulatory developments.

The implementation of these rules and any amendments adopted by the regulatory authorities, could impact our liquidity and funding requirements and practices in the future.

Funding Sources

Our primary sources of funding are deposits, collateralized financings, unsecured short-term and long-term borrowings, and shareholders' equity. We seek to maintain broad and diversified funding sources globally across products, programs, markets, currencies and creditors to avoid funding concentrations.

The table below presents information about our funding sources.

| <i>\$ in millions</i> | As of December | | | |
|---------------------------------|------------------|-------------|------------------|-------------|
| | 2018 | | 2017 | |
| Deposits | \$158,257 | 25% | \$138,604 | 23% |
| Collateralized financings: | | | | |
| Repurchase agreements | 78,723 | 13% | 84,718 | 14% |
| Securities loaned | 11,808 | 2% | 14,793 | 2% |
| Other secured financings | 21,433 | 3% | 24,788 | 4% |
| Total collateralized financings | 111,964 | 18% | 124,299 | 20% |
| Unsecured short-term borrowings | 40,502 | 7% | 46,922 | 8% |
| Unsecured long-term borrowings | 224,149 | 36% | 217,687 | 36% |
| Total shareholders' equity | 90,185 | 14% | 82,243 | 13% |
| Total funding sources | \$625,057 | 100% | \$609,755 | 100% |

Our funding is primarily raised in U.S. dollar, Euro, British pound and Japanese yen. We generally distribute our funding products through our own sales force and third-party distributors to a large, diverse creditor base in a variety of markets in the Americas, Europe and Asia. We believe that our relationships with our creditors are critical to our liquidity. Our creditors include banks, governments, securities lenders, corporations, pension funds, insurance companies, mutual funds and individuals. We have imposed various internal guidelines to monitor creditor concentration across our funding programs.

Deposits. Our deposits provide us with a diversified source of funding and reduce our reliance on wholesale funding. A growing portion of our deposit base consists of consumer deposits. Deposits are primarily used to finance lending activity, other inventory and a portion of our GCLA. We raise deposits, including savings, demand and time deposits, through internal and third-party broker-dealers, and from consumers and institutional clients, and primarily through GS Bank and GSIB. In September 2018, we launched Marcus: by Goldman Sachs in the U.K. to accept deposits.

Secured Funding. We fund a significant amount of inventory on a secured basis. Secured funding includes collateralized financings in the consolidated statements of financial condition. We may

also pledge our inventory as collateral for securities borrowed under a securities lending agreement. We also use our own inventory to cover transactions in which we or our clients have sold securities that have not yet been purchased. Secured funding is less sensitive to changes in our credit quality than unsecured funding, due to our posting of collateral to our lenders. Nonetheless, we continually analyze the refinancing risk of our secured funding activities, taking into account trade tenors, maturity profiles, counterparty concentrations, collateral eligibility and counterparty roll over probabilities. We seek to mitigate our refinancing risk by executing term trades with staggered maturities, diversifying counterparties, raising excess secured funding, and pre-funding residual risk through our GCLA.

We seek to raise secured funding with a term appropriate for the liquidity of the assets that are being financed, and we seek longer maturities for secured funding collateralized by asset classes that may be harder to fund on a secured basis, especially during times of market stress. Our secured funding, excluding funding collateralized by liquid government and agency obligations, is primarily executed for tenors of one month or greater and is primarily executed through term repurchase agreements and securities loaned contracts.

The weighted average maturity of our secured funding included in collateralized financings in the consolidated statements of financial condition, excluding funding that can only be collateralized by liquid government and agency obligations, exceeded 120 days as of December 2018.

Assets that may be harder to fund on a secured basis during times of market stress include certain financial instruments in the following categories: mortgage and other asset-backed loans and securities, non-investment-grade corporate debt securities, equity securities and emerging market securities. Assets that are classified in level 3 of the fair value hierarchy are generally funded on an unsecured basis.

We also raise financing through other types of collateralized financings, such as secured loans and notes. GS Bank has access to funding from the Federal Home Loan Bank. Our outstanding borrowings against the Federal Home Loan Bank were \$528 million as of December 2018 and \$3.40 billion as of December 2017.

GS Bank also has access to funding through the Federal Reserve Bank discount window. While we do not rely on this funding in our liquidity planning and stress testing, we maintain policies and procedures necessary to access this funding and test discount window borrowing procedures.

Unsecured Short-Term Borrowings. A significant portion of our unsecured short-term borrowings was originally long-term debt that is scheduled to mature within one year of the reporting date. We use unsecured short-term borrowings, including U.S. and non-U.S. hybrid financial instruments, to finance liquid assets and for other cash management purposes. In light of regulatory developments, Group Inc. no longer issues debt with an original maturity of less than one year, other than to its subsidiaries.

Unsecured Long-Term Borrowings. We issue unsecured long-term borrowings as a source of funding for inventory and other assets and to finance a portion of our GCLA. Unsecured long-term borrowings, including structured notes, are raised through syndicated U.S. registered offerings, U.S. registered and Rule 144A medium-term note programs, offshore medium-term note offerings and other debt offerings. We issue in different tenors, currencies and products to maximize the diversification of our investor base.

The table below presents our quarterly unsecured long-term borrowings maturity profile as of December 2018:

| <i>\$ in millions</i> | First Quarter | Second Quarter | Third Quarter | Fourth Quarter | Total |
|-----------------------|------------------|-------------------|------------------|-------------------|------------------|
| 2020 | \$ 6,740 | \$9,744 | \$6,308 | \$6,579 | \$ 29,371 |
| 2021 | \$ 3,288 | \$4,162 | \$7,790 | \$7,724 | 22,964 |
| 2022 | \$ 6,151 | \$6,067 | \$5,365 | \$5,876 | 23,459 |
| 2023 | \$10,076 | \$4,958 | \$8,343 | \$4,495 | 27,872 |
| 2024 - thereafter | | | | | 120,483 |
| Total | | | | | \$224,149 |

The weighted average maturity of our unsecured long-term borrowings as of December 2018 was approximately eight years. To mitigate refinancing risk, we seek to limit the principal amount of debt maturing over the course of any monthly, quarterly or annual time horizon. We enter into interest rate swaps to convert a portion of our unsecured long-term borrowings into floating-rate obligations to manage our exposure to interest rates.

Shareholders' Equity. Shareholders' equity is a stable and perpetual source of funding.

SI 4. Description of Derivatives and Hedging Activities

Derivatives are instruments that derive their value from underlying asset prices, indices, reference rates and other inputs, or a combination of these factors. Derivatives may be traded on an exchange or they may be privately negotiated contracts, which are usually referred to as OTC derivatives. Certain of the firm's OTC derivatives are cleared and settled through central clearing counterparties, while others are bilateral contracts between two counterparties.

Market Making. As a market maker, the firm enters into derivative transactions to provide liquidity to clients and to facilitate the transfer and hedging of their risks. In this role, the firm typically acts as principal and is required to commit capital to provide execution, and maintains inventory in response to, or in anticipation of, client demand.

Risk Management. The firm also enters into derivatives to actively manage risk exposures that arise from its market-making and investing and lending activities in derivative and cash instruments. The firm's holdings and exposures are hedged, in many cases, on either a portfolio or risk-specific basis, as opposed to an instrument-by-instrument basis. The offsetting impact of this economic hedging is reflected in the same business segment as the related revenues. In addition, the firm may enter into derivatives designated as hedges under U.S. GAAP. These derivatives are used to manage interest rate exposure in certain fixed-rate unsecured long-term and short-term borrowings, and deposits, and to manage foreign currency exposure on the net investment in certain non-U.S. operations.

The firm enters into various types of derivatives, including:

- **Futures and Forwards.** Contracts that commit counterparties to purchase or sell financial instruments, commodities or currencies in the future.
- **Swaps.** Contracts that require counterparties to exchange cash flows such as currency or interest payment streams. The amounts exchanged are based on the specific terms of the contract with reference to specified rates, financial instruments, commodities, currencies or indices.
- **Options.** Contracts in which the option purchaser has the right, but not the obligation, to purchase from or sell to the option writer financial instruments, commodities or currencies within a defined time period for a specified price.

Derivatives are reported on a net-by-counterparty basis (i.e., the net payable or receivable for derivative assets and liabilities for a given counterparty) when a legal right of setoff exists under an enforceable netting agreement (counterparty netting). Derivatives are accounted for at fair value, net of cash collateral received or posted under enforceable credit support agreements (cash collateral netting).

SI 5. Memberships in Material Payment, Clearing and Settlement Systems

Set forth below is a list of our memberships and contractual relationships with the most material payment, clearing and settlement systems:

| PCS System | Description of Services |
|--|---|
| Bank of New York Mellon | Agent bank whose services include tri-party, custody, and US government security clearing services |
| Canadian Depository for Securities | Securities depository, clearing and settlement hub for Canadian equity, fixed income and money markets |
| Canadian Derivatives Clearing Corp. | Central clearing counterparty for exchange-traded derivative products in Canada |
| Chicago Mercantile Exchange | Service provider for clearing and settlement of futures, options and OTC derivatives |
| Citibank, N.A. | Agent bank providing payment, settlement and custody services across multiple global markets |
| CLS Bank Limited | Multi-currency cash settlement system |
| Depository Trust Company | Central depository providing depository and book-entry services for eligible securities |
| Eurex Clearing AG | Central counterparty for derivatives, equities, bonds and other instruments |
| Euroclear | Central securities depository and provider of settlement and custody services |
| Fixed Income Clearing Corporation | Central counterparty for clearing and settlement of U.S. government and mortgage-backed securities |
| HSBC | Agent bank providing settlement and custody services across multiple global markets |
| ICE Clear Credit | Clearing house for North American credit default swaps |
| ICE Clear Europe | Clearing house for interest rate, equity index and energy derivatives, and credit default swaps |
| ICE Clear U.S. | Clearing house for futures, options and OTC derivatives |
| Japan Securities Clearing Corporation | Clearing service provider for Japanese equities, bonds and derivatives |
| Japan Securities Depository Center, Inc. | Central depository for Japanese securities and foreign securities listed on Japanese exchanges |
| LCH Cleamnet Ltd. | Central counterparty for securities, exchange-traded derivatives and other instruments |
| LCH Cleamnet SA | Clearing house for instruments including equities, bonds, futures, options and credit default swaps |
| National Securities Clearing Corp. Ltd. | Central clearing counterparty for equities, corporate bonds, municipal securities and other instruments |
| Options Clearing Corporation | Central clearing and settlement services provider for options |
| Standard Chartered Bank | Agent bank providing settlement and custody services across multiple global markets |
| SWIFT | Secure messaging platform for the exchange of instructions and messages about financial transactions |

SI 6. Description of Foreign Operations

Our most significant overseas material operating entities for the purposes of resolution planning are:

- Goldman Sachs International (U.K. Broker-Dealer)
- Goldman Sachs International Bank (U.K. Bank)
- Goldman Sachs Japan Co., Ltd (Japan Broker-Dealer)

In total, we have a physical presence in over 30 countries, but our business activities are highly concentrated in just three: the United States, the United Kingdom and Japan.

Due to the highly integrated nature of international financial markets, the firm manages its businesses based on the profitability of the enterprise as a whole. The methodology for allocating profitability to geographic regions is dependent on estimates and management judgment because a significant portion of the firm's activities require cross-border coordination in order to facilitate the needs of the firm's clients.

Geographic results for the firm (not just the core business lines identified in Supporting Information Section SI 1 above) are generally allocated as follows:

- Investment Banking: location of the client and investment banking team.
- Institutional Client Services: FICC Client Execution and Equities (excluding Securities services): location of the market-making desk; Securities services: location of the primary market for the underlying security.
- Investing & Lending: Investing: location of the investment; Lending: location of the client.
- Investment Management: location of the sales team.

2019 RESOLUTION PLAN

The table below presents total net revenues, pre-tax earnings and net earnings (excluding Corporate) by geographic region allocated based on the methodology referred to above.

| \$ in millions | Year Ended December | | | | | |
|--------------------------------|---------------------|-------------|-----------------|-------------|-----------------|-------------|
| | 2018 | | 2017 | | 2016 | |
| Net revenues | | | | | | |
| Americas | \$22,339 | 61% | \$19,737 | 60% | \$18,301 | 60% |
| Europe, Middle East and Africa | 9,244 | 25% | 8,168 | 25% | 8,065 | 26% |
| Asia | 5,033 | 14% | 4,825 | 15% | 4,424 | 14% |
| Total net revenues | \$36,616 | 100% | \$32,730 | 100% | \$30,790 | 100% |
| Pre-tax earnings | | | | | | |
| Americas | \$ 8,235 | 65% | \$ 7,119 | 63% | \$ 6,352 | 61% |
| Europe, Middle East and Africa | 3,266 | 26% | 2,583 | 23% | 2,883 | 28% |
| Asia | 1,112 | 9% | 1,557 | 14% | 1,183 | 11% |
| Subtotal | 12,613 | 100% | 11,259 | 100% | 10,418 | 100% |
| Corporate | (132) | | (127) | | (114) | |
| Total pre-tax earnings | \$12,481 | | \$11,132 | | \$10,304 | |
| Net earnings | | | | | | |
| Americas | \$ 6,960 | 66% | \$ 997 | 23% | \$ 4,337 | 58% |
| Europe, Middle East and Africa | 2,636 | 25% | 2,144 | 49% | 2,270 | 30% |
| Asia | 966 | 9% | 1,241 | 28% | 870 | 12% |
| Subtotal | 10,562 | 100% | 4,382 | 100% | 7,477 | 100% |
| Corporate | (103) | | (96) | | (79) | |
| Total net earnings | \$10,459 | | \$ 4,286 | | \$ 7,398 | |

In the table above:

- Americas net earnings included an income tax benefit of \$487 million in 2018 and estimated income tax expense of \$4.40 billion in 2017 related to the Tax Cuts and Jobs Act.
- Corporate pre-tax earnings includes charitable contributions that have not been allocated to the firm's geographic regions.
- Substantially all of the amounts in Americas were attributable to the U.S.
- Asia includes Australia and New Zealand.

SI 7. Material Supervisory Authorities

As a participant in the banking, securities, investment management, and derivatives industries, we are subject to extensive regulation worldwide. Regulatory bodies around the world are generally charged with safeguarding the integrity of the securities and other financial markets and with protecting the interests of the customers of market participants, including depositors in banking entities and the customers of banks, broker-dealers, investment advisers, swap dealers and security-based swap dealers. The following section refers to the firm (i.e., not only the material entities or the core business lines).

Bank Holding Company Regulation

Group Inc. is a bank holding company under the U.S. Bank Holding Company Act of 1956 (BHC Act) and a financial holding company under amendments to the BHC Act effected by the U.S. Gramm-Leach-Bliley Act of 1999, and is subject to supervision and examination by the Federal Reserve, which is our primary regulator.

Under the system of “functional regulation” established under the BHC Act, the primary regulators of our U.S. non-bank subsidiaries directly regulate the activities of those subsidiaries, with the Federal Reserve exercising a supervisory role. Such “functionally regulated” subsidiaries include broker-dealers registered with the SEC, such as our principal U.S. broker-dealer, GS&Co., entities registered with or regulated by the CFTC with respect to futures-related and swaps-related activities and investment advisers registered with the SEC with respect to their investment advisory activities.

Bank Subsidiaries

Our principal U.S. bank subsidiary, GS Bank, is supervised and regulated by the Federal Reserve, the FDIC, the New York State Department of Financial Services and the Bureau of Consumer Financial Protection. A number of our activities are conducted partially or entirely through GS Bank and its subsidiaries, including: origination of bank loans; personal loans and mortgages; interest rate, credit, currency and other derivatives; leveraged finance; deposit-taking; and agency lending.

The firm’s principal non-U.S. bank subsidiary, GSIB, is a wholly-owned credit institution, regulated by the Prudential Regulation Authority and Financial Conduct Authority in the United Kingdom.

Broker-Dealer and Securities Regulation

Our broker-dealer subsidiaries are subject to regulations that cover all aspects of the securities business, including sales methods, trade practices, use and safekeeping of clients’ funds and securities, capital structure, record-keeping, the financing of clients’ purchases, and the conduct of directors, officers and employees. In the U.S., the SEC is the federal agency responsible for the administration of the federal securities laws. GS&Co. is registered as a broker-dealer, a municipal advisor and an investment adviser with the SEC and as a broker-dealer in all 50 states and the

District of Columbia. U.S. self-regulatory organizations, such as FINRA and the New York Stock Exchange (NYSE), adopt rules that apply to, and examine, broker-dealers, such as GS&Co.

U.S. state securities and other U.S. regulators also have regulatory or oversight authority over GS&Co. Similarly, our businesses are also subject to regulation by various non-U.S. governmental and regulatory bodies and self-regulatory authorities in virtually all countries where we have offices.

Our exchange-based market-making activities are subject to extensive regulation by a number of securities exchanges. As a market maker on exchanges, we are required to maintain orderly markets in the securities to which we are assigned.

Swaps, Derivatives and Commodities Regulation

The commodity futures, commodity options and swaps industry in the U.S. is subject to regulation under the U.S. Commodity Exchange Act (CEA). The CFTC is the U.S. federal agency charged with the administration of the CEA. In addition, the SEC is the U.S. federal agency charged with the regulation of security-based swaps. The rules and regulations of various self-regulatory organizations, such as the Chicago Mercantile Exchange, other futures exchanges and the National Futures Association, also govern commodity futures, commodity options and swaps activities.

GS&Co. is registered with the CFTC as a futures commission merchant, and several of our subsidiaries, including GS&Co., are registered with the CFTC and act as commodity pool operators and commodity trading advisors. GS&Co. and other subsidiaries, including GS Bank, GSI and JANY, are registered with the CFTC as swap dealers. In addition, GS&Co. and Goldman Sachs Financial Markets, L.P. are registered with the SEC as OTC derivatives dealers. Similar types of swap regulation have been proposed or adopted in jurisdictions outside the U.S., including in the E.U. and Japan. For example, the E.U. has established regulatory requirements relating to portfolio reconciliation and reporting, clearing certain OTC derivatives and margining for uncleared derivatives activities under the European Market Infrastructure Regulation.

JANY is authorized by the U.S. Federal Energy Regulatory Commission (FERC) to sell wholesale physical power at market-based rates. As a FERC-authorized power marketer, JANY is subject to regulation under the U.S. Federal Power Act and FERC regulations and to the oversight of FERC. As a result of our investing activities, Group Inc. is also an “exempt holding company” under the U.S. Public Utility Holding Company Act of 2005 and applicable FERC rules.

In addition, as a result of our power-related and commodities activities, we are subject to energy, environmental and other governmental laws and regulations.

Investment Management Regulation

Our investment management business is subject to significant regulation in numerous jurisdictions around the world relating to, among other things, the safeguarding of client assets, offerings of funds, marketing activities, transactions among affiliates and our management of client funds.

Certain of our European subsidiaries, including GSAMI, are subject to the Alternative Investment Fund Managers Directive and related regulations, which govern the approval, organizational, marketing and reporting requirements of E.U.-based alternative investment managers and the ability of alternative investment fund managers located outside the E.U. to access the E.U. market.

Non-U.S. Regulated Broker-Dealer Subsidiaries

In Europe, we provide broker-dealer services that are subject to oversight by national regulators. These services are regulated in accordance with national laws, many of which implement E.U. directives, and, increasingly, by directly applicable E.U. regulations. These national and E.U. laws require, among other things, compliance with certain capital adequacy standards, customer protection requirements and market conduct and trade reporting rules.

The firm's principal non-U.S. regulated broker-dealer subsidiaries include GSI and GSJCL. GSI, the firm's U.K. broker-dealer, is regulated by the PRA and the FCA. GSJCL, the firm's Japanese broker-dealer, is regulated by Japan's Financial Services Agency. These and certain other non-U.S. subsidiaries of the firm are also subject to capital adequacy requirements promulgated by authorities of the countries in which they operate.

SI 8. Principal Officers

Set forth below are the name, present title, principal occupation and certain biographical information for our executive officers, and our Chief Risk Officer. Our executive officers have been appointed by and serve at the pleasure of our Board.

- **Dane E. Holmes.** Mr. Holmes has been an Executive Vice President and Global Head of Human Capital Management since January 2018 and Global Head of Pine Street, our leadership development program, since 2016. He had previously served as Global Head of Investor Relations since October 2007.
- **John F.W. Rogers.** Mr. Rogers has been an Executive Vice President since April 2011 and Chief of Staff and Secretary to our Board of Directors since December 2001.
- **Stephen M. Scherr.** Mr. Scherr has been an Executive Vice President and Chief Financial Officer since November 2018. He had previously served as Chief Executive Officer of Goldman Sachs Bank USA since May 2016, and head of the Consumer & Commercial Banking Division from 2016 to 2018. From June 2014 to 2017, he was Chief Strategy Officer, and from 2011 to 2016 he was Head of the Latin America business. He was also Global Head of the Financing Group from 2008 to 2014.
- **Karen P. Seymour.** Ms. Seymour has been an Executive Vice President, General Counsel and Secretary, and Head or Co-Head of the Legal Department since January 2018. From 2000 through January 2002 and 2005 through 2017, she was a partner at Sullivan & Cromwell LLP, a global law firm, including serving as a member of its management committee from April 2015 to December 2017, and as the co-managing partner of its litigation group from December 2012 to April 2015.
- **Sarah E. Smith.** Ms. Smith has been an Executive Vice President and Global Head of Compliance since March 2017. She had previously served as Controller and Chief Accounting Officer since 2002.
- **David M. Solomon.** Mr. Solomon has been Chairman of the Board since January 2019, and Chief Executive Officer and a director since October 2018. He had previously served as President and Chief or Co-Chief Operating Officer since January 2017 and Co-Head of the Investment Banking Division from July 2006 to December 2016.
- **Robin Vince.** Mr. Vince has been Chief Risk Officer of Goldman Sachs since January 2018. From 2015 to 2018, Mr. Vince was Treasurer.
- **John E. Waldron.** Mr. Waldron has been President and Chief Operating Officer since October 2018. He had previously served as Co-Head of the Investment Banking Division since December 2014. Prior to that he was Global Head of Investment Banking Services/Client Coverage for the Investment Banking Division and had oversight of the Investment Banking Services Leadership Group, and from 2007 to 2009 was Global Co-Head of the Financial Sponsors Group.

SI 9. Description of Material Management Information Systems

Goldman Sachs has a long-standing history of investing in technology. Our management information systems are designed to support and enable the firm's core functions across all service and business units. As an integral component of our Resolution Plan, our systems serve to manage risk and provide complete, timely and accurate information.

Over recent years, we have invested in the broad adoption of technology platforms to support the firm's enterprise architecture. In most cases, a single technology platform supports a given function across all geographies and entities. For example, our broker-dealer subsidiary in Tokyo books its secured funding transactions (such as repos) into the same technology platform as our broker-dealer subsidiaries in London, New York or elsewhere. This results in a high degree of consistency in both functionality and reporting to enable key decision making at all levels.

As a firm, we place a strong focus on developing software applications internally, although we also make use of third-party vendor software. Our system architecture supports data, modeling, user interface and workflow capabilities, which our MIS systems leverage to provide a rich feature set for our businesses. To ensure the rigor and effectiveness of our systems, we have focused on promoting standardization and reusability.

Our data aggregation capabilities and risk reporting practices are overseen by a governance framework which is supported by documented policies, standards and procedures. We recognize that, in a resolution scenario, the effectiveness of our systems is driven by adhering to an appropriate governance framework which is supported by the relevant controls. For example, our business resiliency program is intended to ensure that all critical applications, including our data aggregation capabilities and risk reports, are available not only in normal times, but also during times of stress or crisis scenarios.

The Firmwide Technology Risk Committee reviews matters related to the design, development, deployment and use of technology. This committee oversees cyber security matters, as well as technology risk management frameworks and methodologies, and monitors their effectiveness. Our governance framework is supported by documented policies, standards and procedures. We have developed and implemented a framework of principles, policies and technology to protect client and firm assets from cyber-attacks and other misappropriation, corruption or loss; safeguards are applied to maintain the confidentiality and availability of information resources.

Our MIS have extensive ad hoc reporting capabilities, and have been used extensively to prepare financial and other information used in the preparation of our Resolution Plan. We have performed a detailed assessment of our ability to satisfy MIS reporting requirements in resolution, and we have determined that there are no material gaps or weaknesses in our ability to provide relevant data in a crisis scenario.

Recovery and Resolution Systems

As part of our resolution planning, we recognize the benefits of being able to identify, aggregate, visualize and easily navigate key interdependencies and relationships across the firm's legal entities and critical services. We therefore developed and continue to invest in a platform that leverages existing, authoritative sources of data, and links them in a flexible and adaptable way to provide a holistic understanding and visualization of the firm's legal entities, services, functions, systems, people, vendors and facilities. The tool is integrated with several of the firm's other platforms, including the global framework for the documentation and management of the inter-affiliate SLAs, the firm's "document lake" which stores resolution-critical legal agreements and associated metadata, and the firm's "data lake" which is a central data warehousing solution.

SI 10. Reconciliation of Non-GAAP Balance Sheet Allocation

The table below presents the reconciliation of our balance sheet allocation on page 11 to our U.S. GAAP balance sheet:

| <i>\$ in millions</i> | GCLA, Segregated Assets and Other | Secured Client Financing | Institutional Client Services | Investing & Lending | Total |
|--------------------------------|--|--------------------------------|-------------------------------------|---------------------------|------------------|
| As of December 2018 | | | | | |
| Cash and cash equivalents | \$130,547 | \$ - | \$ - | \$ - | \$130,547 |
| Resale agreements | 87,022 | 32,389 | 19,808 | 39 | 139,258 |
| Securities borrowed | 10,382 | 83,079 | 41,824 | - | 135,285 |
| Loans receivable | - | - | - | 80,590 | 80,590 |
| Customer and other receivables | - | 29,764 | 42,006 | 7,545 | 79,315 |
| Financial instruments owned | 85,187 | - | 204,584 | 46,390 | 336,161 |
| Subtotal | \$313,138 | \$145,232 | \$308,222 | \$134,564 | \$901,156 |
| Other assets | | | | | 30,640 |
| Total assets | | | | | \$931,796 |

In the table above, total assets for Institutional Client Services and Investing & Lending represent inventory and related assets.