LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT
UNIVERSIDADE DE LISBOA

# MASTER OF SCIENCE IN
FINANCE

# MASTERS FINAL WORK
PROJECT

EQUITY RESEARCH:
THE GOLDMAN SACHS GROUP, INC.

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This is an undertaking that would not be possible without the support of several people.

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Last but not least, to my friends and colleagues for making this an enjoyable journey. The insights from my friend Miguel Frasco were of great help.

Thank you!

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# Abstract

This report encompasses a valuation of The Goldman Sachs Group, Inc. elaborated as a Master's of Finance Final Work Project at ISEG – University of Lisbon. The study follows the format recommended by the CFA Institute (Pinto, Henry, Robinson, and Stowe, 2010). To conduct this research, we considered public available data on October 5th, 2017, collected from various sources, such as company reports and Bloomberg L.P., among others. Therefore, events after this date are not reflected in this analysis.

We decided to conduct a valuation of Goldman Sachs for two main reasons, them being: conducting this type of work on financial service firms represents, in my opinion, a greater challenge compared to industrial companies (as it was previously performed during the master degree); the second reason is because, in my opinion, The Goldman Sachs Group, Inc. is one of the most interesting companies in the world for all its history, controversies and power in the major financial markets.

To reach a recommendation, we used an Excess Return model to value the equity of the firm, as well as a multiples analysis to complement the previous model. With a price target of **$ 230.25** for YE18 and a downside potential of **-5.0%** from the current price of **$ 242.55**, our final recommendation for The Goldman Sachs Group, Inc. (NYSE: GS) is "**Reduce**".

**JEL classification**: G1; G2

**Keywords**: Equity Research; Valuation; Financial Institution; Investment Banking;

# Resumo

Este relatório contém uma avaliação do grupo financeiro *The Goldman Sachs Group, Inc.*, elaborado como Projeto Final do Mestrado em Finanças do ISEG – Universidade de Lisboa. O estudo segue o formato recomendado pelo *CFA Institute* (Pinto, Henry, Robinson, e Stowe, 2010). Para efetuar a avaliação, foi considerada informação pública a 5 de outubro de 2017, recolhida de diversas fontes, tais como relatórios anuais ou *Bloomberg L.P.* Consequentemente, eventos ocorridos após esta data não são considerados nesta análise.

As razões que levaram à escolha da *Goldman Sachs* foram essencialmente duas: devido à complexidade que empresas financeiras apresentam, é um maior desafio quando comparando com empresas industriais (como realizado durante o mestrado); e é, na opinião do autor, uma das empresas mais interessantes a nível mundial por toda a sua história, controvérsias e poder nos principais mercados financeiros.

Para obter uma recomendação, foi utilizado um modelo de Excesso de Retorno para valorizar o capital próprio do banco e uma avaliação por múltiplos para complementar o modelo principal. Com um preço-alvo de $ 230.25 e potencial de desvalorização de -5.0% a partir do preço atual de $ 242.55, a nossa recomendação final para *The Goldman Sachs Group, Inc.* (NYSE: GS) é “Reduzir”.

**Classificação JEL:** G1; G2

**Palavras-Chave:** *Equity Research*; Avaliação de Empresas; Instituição Financeira; Banca de Investimento

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# The Goldman Sachs Group, Inc.

## Reduce

Medium risk

5 October 2017

Portugal

FY18 Price Target of $ 230.25 (- 5.0%); Recommendation is to Reduce

## *A bank for the other 99%*

Goldman Sachs is an American-based global leading investment bank, present in the major financial centers around the globe. The business is divided into four business segments: Investment Banking (IB); Investment Management (IM); Institutional Client Services (ICS); and Investing & Lending (IL).

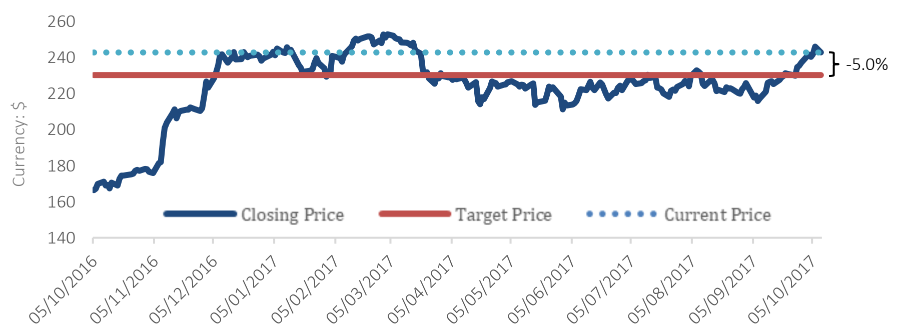
## Key statistics

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ticker | NYSE: GS | 52-Wk High | $252,89 | Shares Outstg. | 386.88m | 5 Year Beta | 1.273 |
| Website | www.goldmansachs.com | 52-Wk Low | $166,40 | Market Cap. | $93,57bn | Float % | 90,20% |
| Industry | Diversified Financials | Current Price | $242,80 | Dividend Yield | 1,25% | Institut. Own. % | 74,07% |

## Stock Performance

Figure 1: Historical Share Price

*Source: Bloomberg and FLF analysis*




## Highlights

- With a price target of $ 230.25 and a downside potential of -5.0% from current price of $ 242.55, our recommendation for The Goldman Sachs Group, Inc. stands for Reduce. We estimate EPS of $ 16.09 in FY17F and $ 16.15 in FY18F, contrasting to $ 16.58 in FY16A and $ 12.40 in FY15A. The conclusions from our Market Approach (multiples) supports our conclusion from our DCF Approach. By observing the results of the Market Approach, we conclude that GS is undervalued when comparing to its peers by 13%. This is justified, in our opinion, by the recent performance of some of GS's core businesses.
- In an attempt to find new streams of revenue, as its core businesses are pressed by tight regulations, the company launched Marcus by Goldman Sachs. Going head to head against retail banks and the new *fintech* firms, which are emerging, this shift to digital platforms marks the entry in the consumer lending venture. Marcus offers personal loans of up to $30.000 and is a step further from the online savings accounts starting at $1. We expect these platforms to boost deposits and interest revenues in the next years.
- GS presented a healthy performance throughout the first two quarters, beating investors' estimates. Net revenues in FY17 were $15.91 billion, 12% higher than FY16, improving the pre-tax margin by 340 basis points for 31.7%. Debt underwriting and investment management had one of its best performances, however the FICC unit registered an underwhelming result. The firm also maintained strong liquidity and capital ratios. Building on the positive results of the first two quarters, we forecast annual revenues to increase around 4% in FY17, and from this year onwards 1.53% CAGR until FY21. It is our belief that that the firm will focus on restructuring troublesome business units and continue to invest in new technologies, products and services.

Table 6: Valuation sensitivity analysis

*Source: Cristal Ball software and FLF analysis*

| | | Market risk premium | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 3.00% | 3,50% | 4,00% | 4.50% | 5.00% | 5,50% | 6,00% |
| Risk-free rate | 1,82% | 370,73 | 318,56 | 278,94 | 247,71 | 222,36 | 201,29 | 183,43 |
| | 2,02% | 351,57 | 304,2 | 267,74 | 238,69 | 214,91 | 195,01 | 178,05 |
| | 2,22% | 334,25 | 291,03 | 257,35 | 230,25 | 207,90 | 189,07 | 172,93 |
| | 2,42% | 318,52 | 278,91 | 247,69 | 222,34 | 201,27 | 183,42 | 168,04 |
| | 2,62% | 304,17 | 267,71 | 238,67 | 214,90 | 195.00 | 178,04 | 163,36 |

Table 1: Analyst's Risk Assessment

*Source: FLF analysis*

| Low | Medium | High |
|---|---|---|

Our risk assessment reflects intense internal competition across all markets, but protected from the outside by regulation and high costs.

Table 2: FY16 Key metrics

| | FY16 | YoY Δ |
|---|---|---|
| Net Revenues | $30.6bn | (9%) |
| Pre-Tax Earnings | $10.3 | +17% |
| Net Income | $7.4bn | +22% |
| Diluted Eps | $16.29 | +34% |
| ROE | 9.4% | +200bps |
| BVPS | $177.09 | +6.7% |

*Source: Statutory reports*

Table 3: Consolidated Revenues

| in $m | 1Q | 2Q | 3Q | 4Q | FY |
|---|---|---|---|---|---|
| 17A | 8.026 | 7.887 | - | - | 31.826 |
| 16A | 6.338 | 7.932 | 8.168 | 8.170 | 30.608 |
| 15A | 10.617 | 9.069 | 6.861 | 7.273 | 33.820 |
| 14A | 9.328 | 9.125 | 8.387 | 7.688 | 34.528 |
| 13A | 10.090 | 8.612 | 6.722 | 8.782 | 34.206 |
| 12A | 9.949 | 6.627 | 8.351 | 9.236 | 34.163 |

*Source: Statutory reports and FLF analysis*

Table 4: Excess return valuation

| | |
|---|---|
| Equity Invested | $ 75.244 |
| PV of Equity Excess Return | 17.279 |
| Value of Equity | 92.523 |
| Number of shares | 401,830 |
| Value Per Share | $ 230,25 |

| | |
|---|---|
| Current price | $ 242,55 |
| Upside Potential | -5% |

*Source: Bloomberg and FLF analysis*

Table 5: Multiples Valuation

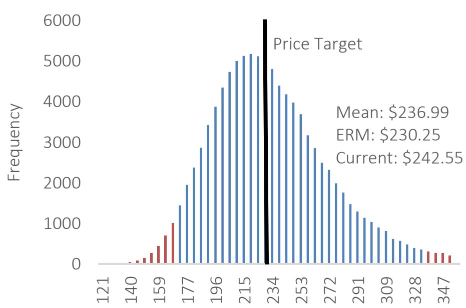
| Multiple | Mean | Implied Equity value |
|---|---|---|
| P/E FY16A | 13,54 | $ 224,59 |
| P/E FY17F | 13,72 | 220,68 |
| P/B FY16A | 1,37 | 277,85 |
| P/B FY17F | 1,36 | 286,53 |

| | |
|---|---|
| Fair Value | $ 252,41 |
| Current Price | $ 242,55 |
| Upside Potential | 4% |

*Source: Bloomberg and FLF analysis*

Figure 2: Monte Carlo Simulation

*Source: Cristal Ball software and FLF analysis*

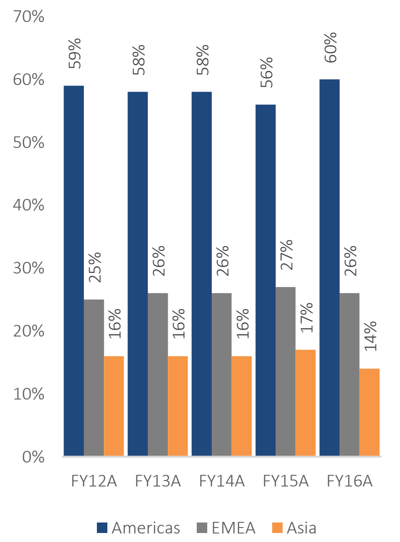


# Investment Summary

With a price target of $ 230.25 for YE18F and a downside potential of -5.0% from current price $242.80, our recommendation for Goldman Sachs is Reduce. GS's stock growth is expected to be low to moderate, following the trend from past months, for two reasons. Firstly, although GS is undervalued by -13% when comparing to its peers, with respect to equity price multiples, we expect it to continue that way, and secondly, it currently trades close to intrinsic value.

Being a global business, with a presence in all major financial centers has its own advantages and disadvantages. Diversification of revenue sources and access to markets are some of the advantages that one needs to acknowledge, however the changing laws and regulations that the company faces in the different parts of the globe where they operate represent a challenge for Goldman Sachs which can have a negative impact on the company. By analyzing existing investments, we expect the relative size of operations by region of activity to remain close to current and historical values (Figure 3).

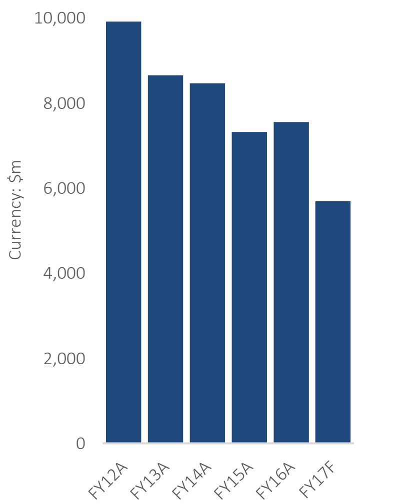
Figure 3
Total revenues, by location
*Source: Statutory reports and FLF analysis*




## Valuation methods

The target price results from the application of an absolute valuation method to the equity, more specifically, the Excess Return Model. For a variety of reasons specified in the following sections of the present report, the analysis was conducted on a consolidated level. To support the conclusions reached with this model, we conducted a valuation through a relative valuation method, using equally weighted multiple comparables. A set of criteria was applied when selecting the peer comparable companies to ensure that this was a solid way to support the conclusions of the much robust discount method.

Figure 4
FICC Revenues
*Source: Statutory reports and FLF analysis*



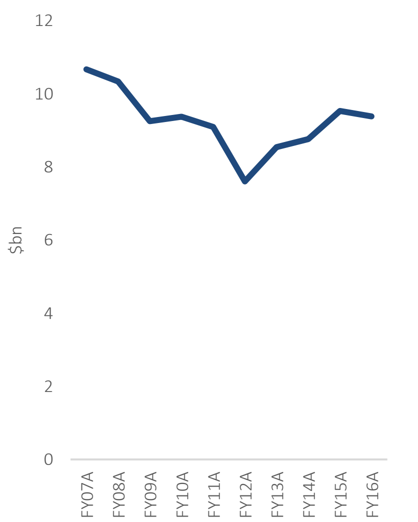

## Recent stock performance

The stock, which is present in the S&P 500, have ranged from $166,4 to $252,89 in the past 52-weeks, and has traded around the target price and below the current price, for the last 25 weeks.

## Rebuilding FICC

In the first half of the year, revenues from the worrying Fixed Income, Currency and Commodities unit (FICC), a core business of the firm, suffered a significant decline (40%) compared to its homologous period, presenting a result of $2.85 billion (Figure 4). This figure was $9.4 billion in 2010. With the current plan in place to cut costs, enter new areas and restructure the division, we expect revenues to return to positive yearly variations in 2019.

Figure 5
Brand Value
*Source: "Interbrand"*




## Risks to the investment case

Investors should be aware of threats that may impact the business. Key risks to our estimates and price target include regulatory changes, unexpected changes in interest rates, slowing of global growth, and decreases in asset values that can impact, among others, fees from asset-management.

## Position in the Industry

In an industry where reputation and relationships play big roles, Goldman Sachs' most valuable asset is its brand (Figure 5). Since the 2008 crisis, the brand has suffered several setbacks with reputational damage, nonetheless, was able, to a certain degree, to conjure an image of power to the markets. The launch of *Marcus* represents the company's attempt to adopt a strategy more relatable to the masses. Innovation in new products and services, sustainable corporate governance policies and transparency will be determinant to successfully demonstrate this new image to the market.

## Business Description

**The Goldman Sachs Group, Inc.** (NYSE: GS) is an American financial company based in the State of Delaware, which, together with its consolidated subsidiaries, provides a diversified array of financial services to multiple clients, such as: individuals; financial institutions; corporations; and governments. Founded in 1869, the firm is a leading investment management, securities and investment banking firm with presence in all major financial centers around the globe.

The firm[1] is a financial holding as well as a bank holding company regulated by the Federal Reserve System, which is supervised by the Federal Reserve Board. It is through GS Bank USA, the key U.S. bank subsidiary, that the majority of the firm's consumer-oriented activities are partially or entirely conducted. Goldman Sachs International (GSI) and Goldman Sachs International Bank (GSIB) are the main E.U. operational branches, currently headquartered in the U.K.

As of the end of 2016, the firm has offices in more than 30 countries distributed by the North and South Americas, EMEA and Asia (Figures 6 and 7). Roughly 47% of the firm's staff is based outside the Americas and 40% of revenues in 2016 were also generated outside this region.

Goldman Sachs divides its activities in four business segments: Investment Banking, Institutional Client Services (ICS), Investing & Lending and Investment Management.

**Investment Banking** provides Financial Advisory services concerning mergers and acquisitions, restructurings, divestitures, spin-offs, corporate defense activities and risk management. The firm also offers equity and debt underwriting such as public offerings, capital raises and private placements of equity and debt instruments.

In **Institutional Client Services**, the firm acts as a market maker and supports client transactions in currency, equity, fixed income and commodity products, mostly with institutional investors. It also provides brokerage services like financing and securities lending, and operates in the major stock and derivatives exchanges worldwide as a market maker and clearing agent. This is the most important business segment for the firm.

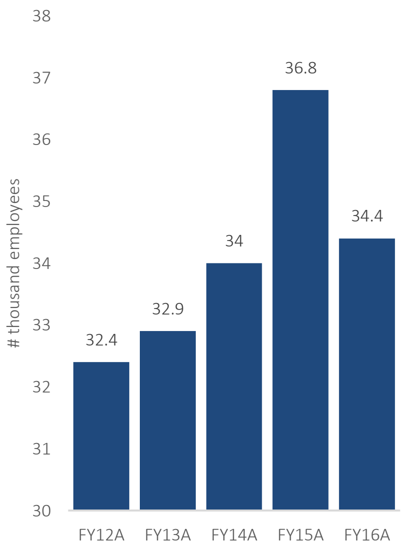
Through the **Investment & Lending** segment, GS takes a long-term investing approach in infrastructure, real estate, corporate and other equity and debt-related investments. It also provides banking services such as consumer lending, through the new online platform Marcus by Goldman Sachs, deposits and corporate lending.

The **Investment Management** business segment provides wealth advisory services to high-net-worth clients, including portfolio management, brokerage and financial counseling. It offers also several investment products across the major asset classes and investment management services to its individual and institutional clients.

The Group prepares and presents its consolidated financial statements in accordance with the U.S. GAAP and has investment grade rating (Appendix K).

Figure 6
Global locations
*Source: Company website*

Figure 7
End-of-year number of employees
*Source: Statutory reports and FLF analysis*




[1] When referring to "Goldman Sachs", the "firm", the "group" and "GS", it is to be understood The Goldman Sachs Group, Inc. (Group Inc., or parent company), and its consolidated subsidiaries

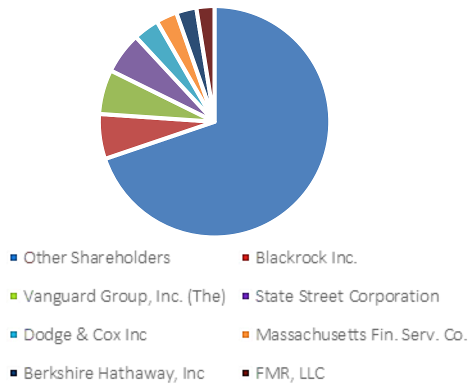
## Ownership Structure

The ownership of GS is divided in Common Shareholders and Preferred Shareholders. The holders of the first have the right to participate and vote in general shareholders meetings, profit sharing, obtain information, among others. The holders of the latter, have the same rights with the main exceptions of having preference in dividends, and do not have the right to vote in general meetings.

According to the latest 13F filling, as of June 29th, 2017, institutional holdings account for 74% of the total common shareholder structure. A total of 1.567 institutions, of which 1.293 are institutional holders, held Goldman Sachs' common stock (Figure 8).

Insiders hold less than 1% of total common shares outstanding.

Figure 8
Largest Common Shareholders
*Source: Nasdaq Stock Exchange and FLF analysis*



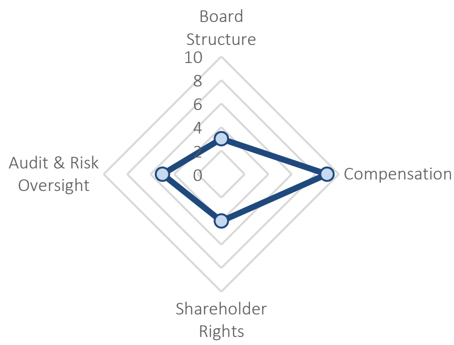

## Corporate Governance

Goldman Sachs follows the Anglo-Saxon model of corporate governance in which the shareholders elect the members of the Board of Directors. The latter then elects the executive officers that, alongside the management committee, run the day-to-day operations of the firm. The Board of Directors has established five Committees: Audit; Compensation; Corporate Governance & Nominating; Risk; and Public Responsibilities. Throughout 2016 and first half of 2017, numerous changes were done in the executive ranks, as well as an addition to the Board of Directors. The latter is composed by eleven members, including a Lead Director, that ensures an open and free discussion among its independent members, and the Chairman. From these eleven members, one is an insider – Lloyd C. Blankfein – and two are former GS top employees. The rest of the members are believed to be independent (Appendix L).

Given the complexity of the business, the shareholder structure, the number of committees and the size of the company, I believe that the board has a high level of independence and objectivity to fulfill its responsibilities to the shareholders.

According to the ISS Governance QualityScore™ (Figure 9), Goldman Sachs has a decile score of 7 out of 10. In this methodology, lower scores represent lower governance risk. This indicates that GS has a moderate to high governance risk.

Figure 9
ISS Governance QualityScore™
*Source: ISS and FLF analysis*




Goldman Sachs was one of first financial institutions to acknowledge the importance of environmental sustainability. In 2015 it established its Environmental Policy Framework, thus formalizing its commitment to mobilize capital to scale up clean energy and foster sustainable economic growth.

According to Bloomberg (Table 7), the company demonstrates an above average performance concerning environmental areas, neutral in social issues and has a below average performance in terms of governance, when compared to its peers.

Table 7
ESG grades for Goldman Sachs
*Source: Bloomberg*

| | |
|---|---|
| "RobecoSAM Rank" | 75 |
| "Sustainalytics Rank" | 87.7 |
| "ISS QualityScore" | 7 |
| "CDP Climate Score" | 8 |
| "Bloomberg ESG Disclosure" | 48.2 |

## NEOs Compensation

Public companies are required by the S.E.C. to determine every year which executives are named executive officers (NEOs), under the proxy disclosure rules. These are the company's CEO, CFO and the three most highly compensated executive officers other than the CEO and CFO. They are also obligated to disclose the annual compensation of the NEOs. Regarding Goldman Sachs they were Lloyd C. Blankfein, Gary D. Cohn, Harvey M. Schwartz, Michael S. Sherwood and Mark Schwartz for both 2015 and 2016 (Table 8).

Table 8
NEOs Compensation
*Source: Statutory reports and FLF analysis*

| | FY16A | FY15A |
|---|---|---|
| Salary | 14,85 | 15,15 |
| Bonus | 19,44 | 22,64 |
| Stock awards | 61,07 | 66,54 |
| Non-equity incentive plan | 47,00 | 0,00 |
| Change in pension value | 0,25 | 0,03 |
| All other compensation | 8,73 | 8,16 |
| Total compensation | 151,32 | 112,51 |

## Goldman Sachs Competitive Position

Table 9

### SWOT Analysis

*Source: FLF Analysis*

| Strengths | Weaknesses |
|---|---|
| . Strong brand and presence across the major financial centers;<br>. Diverse operations with wide array of financial products and services provided;<br>. High R&D, comparing to competitors, and capacity to recruit and retain talent;<br>. Strong financial position. | . Stained public image after bribery & fraud cases and litigation issues;<br>. Market and economic fluctuations produce variable revenues. |
| **Opportunities** | **Threats** |
| . Expansion in emerging markets;<br>. Cross selling opportunities;<br>. Consolidating industry;<br>. Growth potential in the investment management and lending segments. | . Uncertainty on regulations;<br>. Volatility in financial markets;<br>. Variability in interest rates;<br>. Possibility of conflicts of interest. |

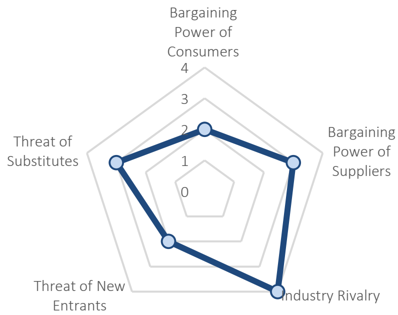
### Porter's Five Forces

It is important to retain that although Goldman Sachs is a global group with presence in all the major financial centers, it is still an American banking group subject primarily to American law and regulations. Additionally, all the big players and competitors of GS in the investment banking business are either American or international, with presence in the American market. These reasons allow for the following analysis to be focused on the American market without losing the global overview of the entire company (Figure 10).

Figure 10

Porter's Five Forces

*Source: FLF Analysis*




#### Bargaining Power of Consumers – Low (2)

Goldman Sachs' clients, especially HNWI, don't have a lot of bargaining power as they are highly dependent on the company's services. These services have a large value added. Although GS can survive the loss of several non-institutional clients, it offers complementary products and services to address this risk.

#### Bargaining Power of Suppliers – Significant (3)

Being a supplier in the Investment Banking industry is a very subjective concept. Goldman Sachs, as all firms, has several companies that supply services to the bank (databases, communications, among others). These suppliers don't have much bargaining power. However, the most important inputs to the business are knowledge, where competition to recruit and retain highly skilled employees is very high, and capital. This capital can arise from depositors and other creditors, investors in the firm, other banks and the Federal Reserve System. Depositors and other creditors individually don't possess great bargaining power but, as a whole, can be very important for both the capitalization and liquidity of the bank. A large firm that is issuing new stock is a kind of product supplier, as this is the input that GS needs to sell its services to other customers, making the line that separates a supplier and a consumer very difficult to differentiate. Other banks and financial institutions that offer liquidity don't have much bargain power because the duration of such commitments is very low. The Federal Reserve System, as a supplier of liquidity and guidance, and ultimate regulator holds a great bargaining power over GS. There are, however, institutions that, although not direct suppliers, have a greater power over the products and input costs of Goldman Sachs – the Congress and the Treasury Department. These institutions, alongside the Fed, decide which products and services can be sold, how and to whom they are marketed and what compensations can the company accept for them.

### Industry Rivalry – Significant (4)

For several years, this large industry has been increasing its concentration and the major players have been able to secure a high market share. Yet, there are still many competitors within this same market, and unnoticeable differentiation on products and services that banks provide. This is due to regulatory constraints as well as low switching costs for the clients. Reputation and previous relationships are therefore critical to succeed in this market.

In respect to its four business segments, the main competitors of Goldman Sachs are JPMorgan Chase & Co, Deutsche Bank AG and Morgan Stanley. The latter is considered GS's main rival due to its similarity in terms of size and operations, and is frequently used while evaluating GS's results relatively to its peers.

### Threat of New Entrants – Low (2)

Through the signing of the Dodd-Frank Act in 2010, it became harder for new institutions to enter this already concentrated market. Among other reasons, new companies face increasing obstacles when entering new markets, such as: intense regulations; difficulty in developing and establish network of contacts; managing reputation; infrastructures; and specialized staff. All these reasons can become a source of cost inefficiencies for new companies. Thus, the probability of existing companies that are already well established to enter a new market is higher than for those which are only now emerging.

### Threat of Substitutes – Moderate (3)

In terms of its core businesses, the possibility for new products or services to emerge is very limited due to the regulations in place. I&L is a business segment that is expanding, however it faces the threats of new and more technological products and services. The development of FinTech companies is shaking the industry with new products that have lower costs and are easier for consumers. It is important to emphasize that Goldman Sachs is investing heavily in new technologies and products, such as the new platform Marcus by Goldman Sachs, in an attempt to establish themselves in this new era of FinTech products.

# Macroeconomic Outlook

## Global

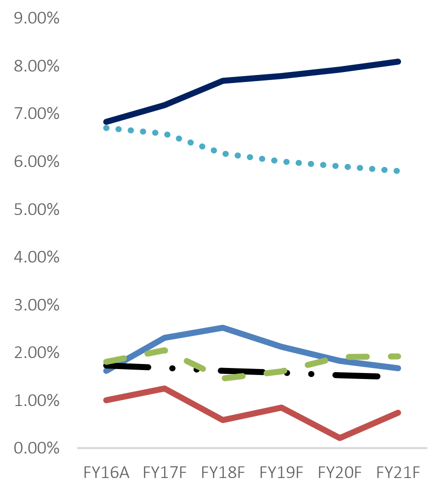
The global economy has been gradually gaining strength, and it will most likely continue to do so over the next few years (Figures 11 through 14). Global GDP growth should see an increase from 2.42% in 2016 to 2.88% in 2017 and remain close to 3% until 2022 – driven by the countries in the Asian continent. China and India will continue with vigorous growth but other large emerging countries like the Russian Federation, Brazil and Argentina will return to a period of growth from 2017 onwards, thus exiting recession. Although the growth outlook is favorable due to recovery in investment and structural reforms, American and European countries will remain in the tail of growth, with rates close to 2% annually.

Financial markets have also improved, as reflected in low bond yields and high equity prices.

Although this is clearly an indication of positive outlook for the following years, these developments hold significant uncertainties that should be taken into consideration, such as the rise of protectionism, complacency of policymakers or the break of military conflicts.

Figure 11
Real GDP growth, by country

*Source: IMF and FLF analysis*

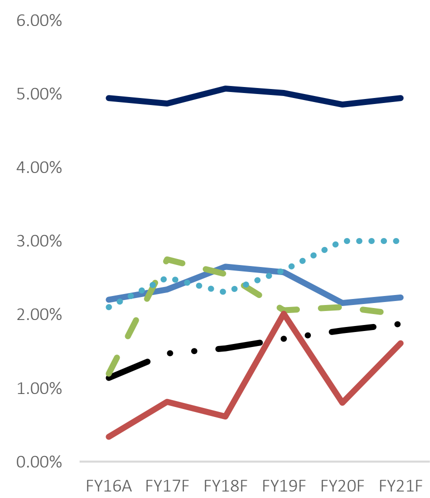



## United States

U.S. real GDP growth rate is expected to grow to 2.30% in 2017 and 2.50% in 2018 from the 1.60% mark presented in 2016, but returning to values below the 2.00% threshold after 2019. Inflation is anticipated to stay above the target of 2.00% and unemployment will continue to stay around natural levels close to 5,00%, leading to further increases in the main refinancing operations rate from the U.S. Federal Reserve. This rate is expected to rise to 1.50% before the end of 2017, return to regular levels of 2.00% in 2018, and is expected that in 2019 this rate will rise to 3.00%. Debt levels are above 100% of GDP and will continue to rise from 107.35% in 2016 to expected values above 115.00% in 2021.

Figure 12
Year-end Inflation rate, by country

*Source: IMF and FLF analysis*



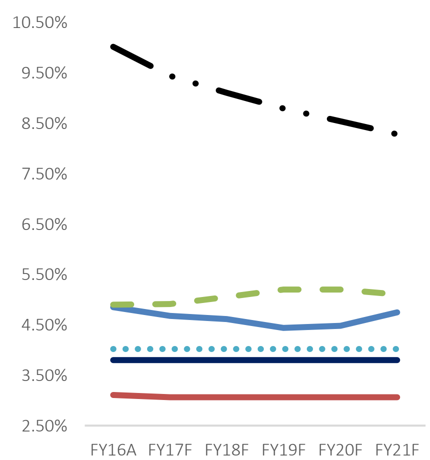

## Europe

In the Euro Area, real GDP growth will remain close to 1.50% per year and inflation will continue its growing path to the ECB's target, close to 2,00%. ECB will maintain its main refinancing operations rate at 0.00% and the pace of its monthly asset purchase at €60 billion until the end of 2017, and later if necessary. As inflation approaches its target and economic indicators across the Euro Area improve its sustainability, it is expectable that the current QE program decrease its monthly purchases and eventually cease to exist, and the main refinancing rate should start to increase to normal values. Unemployment will decrease past the 10.00% mark in 2017 and continue to do so but will remain high. Debt levels are expected to steadily decrease from around 90.00% of GDP in 2017 to close to 80.00% of GDP in 2022.

In the U.K., the economy will take a hit after the decision to leave the European Union. Real GDP growth is expected to slow down in the next two years from 1,86% in 2016 to 1,46% in 2018, but increase to values close to 1,90% by 2022. Inflation will take an opposite direction and will decrease from an estimated 2.75% annual inflation in 2017 to 2.00% in 2021. As well as in the Euro Area, interest rates are at historical low levels

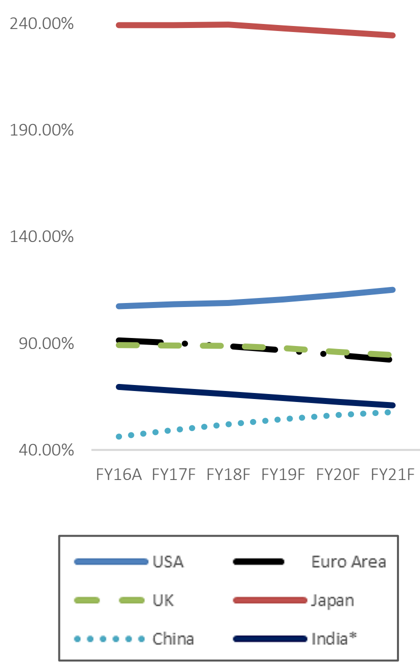
Figure 13
Unemployment rate, by country

*Source: IMF and FLF analysis*



(0.25%, in the UK) and a QE program is in place that should begin to be tapered after the end of 2017.

Figure 14
Debt-to-GDP ratio, by country
*Source: IMF and FLF analysis*




## Asia

The Japanese economy has been characterized by substantial amounts of debt, low unemployment rates, slow real growth rates and years of low inflation with periods of deflation in between. Debt levels will decrease but remain above 200% of GDP, growth of GDP will have a moderate recovery and inflation is predicted to cross 1.00% in 2018, but with difficulties to reach the 2.00% target.

In China, real GDP growth is projected to continue to deaccelerate from 6,70% in 2016 to close to 5,7% in 2022 and inflation is expected to grow to values around 3,00% by 2020. Government debt is set to increase to values close to 60.00% of GDP and unemployment will remain low.

As the Chinese economy slows down, the growth of the Indian economy is expected to accelerate even more from 6.83% to values above 8.00% in 2021 while retaining low unemployment levels and acceptable decreasing values of debt. Inflation is likely to remain close to 5%.

# Business segment's historical performance

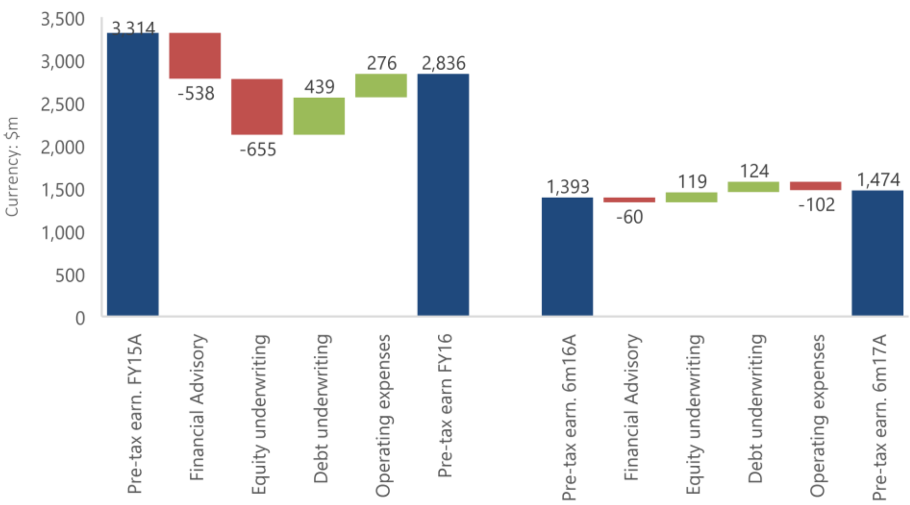
## Investment Banking

IB´s revenues (Figure 15) demonstrated an upwards trend from $4.9bn in FY12 to $7.0bn in FY15. FY16 saw a decrease of revenues to $6.3bn, mainly, due to a decrease in financial advisory fees. We emphasize the impact of the increase in financial advisory fees (+48%) in supporting the growth of this segment, since revenues from underwriting, especially equity, increased by just 13% from FY12 to FY16.

Following the revenue tendency in those years, pre-tax earnings increased considerably from $1.6bn to $2.8bn, representing a jump of 78% due to controlled operating expenses that remained close to $3.5bn (Figure 16).

Figure 16
Investment Banking bridge FY15A-FY16A and 6m16A-6m17A

*Source: Statutory reports and Team analysis*




## Institutional Client Services

In the opposite direction, ICS's revenues (Figure 17) decreased from FY12 ($18.1bn) to FY16 ($14.5bn). Equity services' revenue decreased more than $1bn, yet FICC had a more expressive decrease – almost $2.5bn in the same period.

Following measures to control costs, operating expenses decreased from $12.5bn in FY12 to $9.7bn in FY16, resulting in pre-tax earnings of $5.6bn and $4.8bn in FY12 and FY16, respectively (Figure 19).

Figure 19
Institutional Client Services bridge FY15A-FY16A and 6m16A-6m17A

*Source: Statutory reports and FLF analysis*

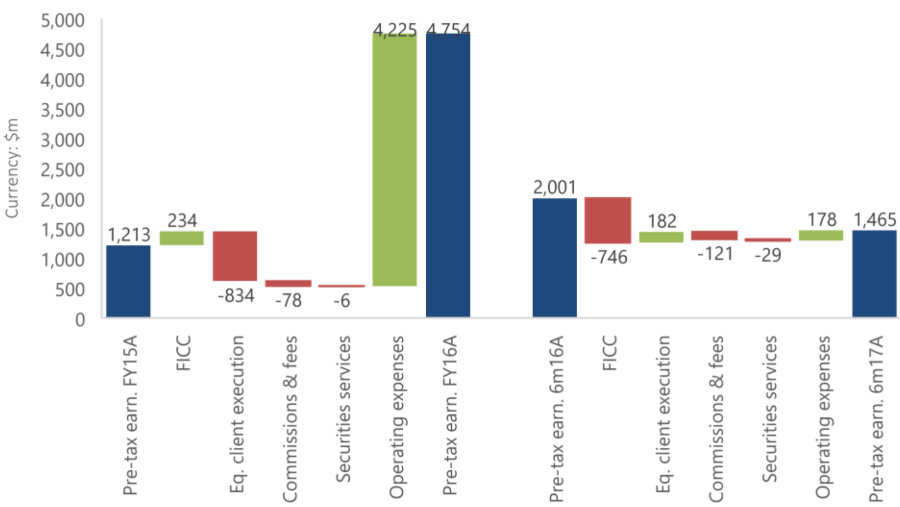



Figure 15
IB's revenue, by source

*Source: Statutory reports and FLF analysis*

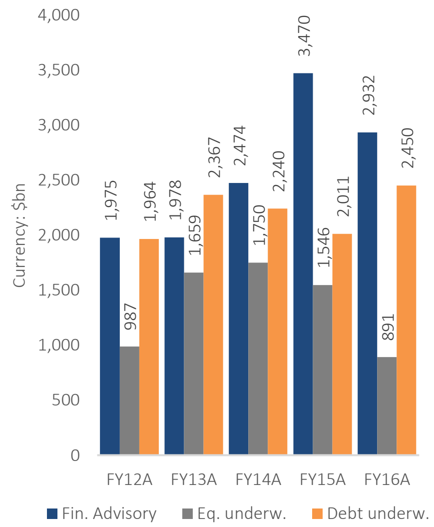



Figure 17
ICS's revenue, by source

*Source: Statutory reports and FLF analysis*

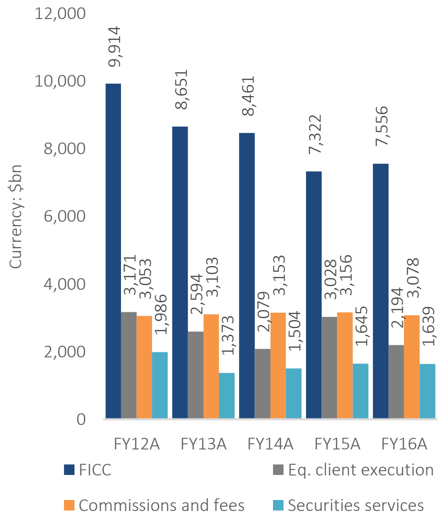
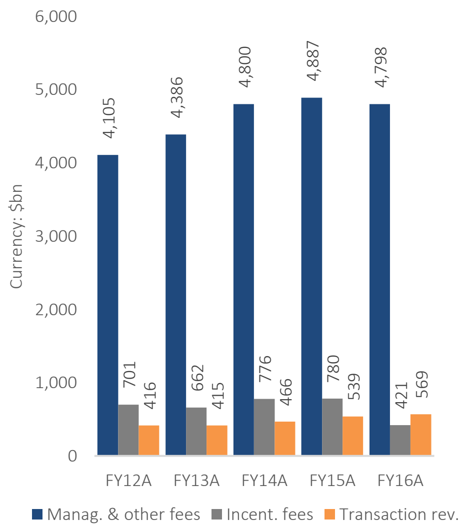



Figure 18
IM's revenue by source

*Source: Statutory reports and FLF analysis*



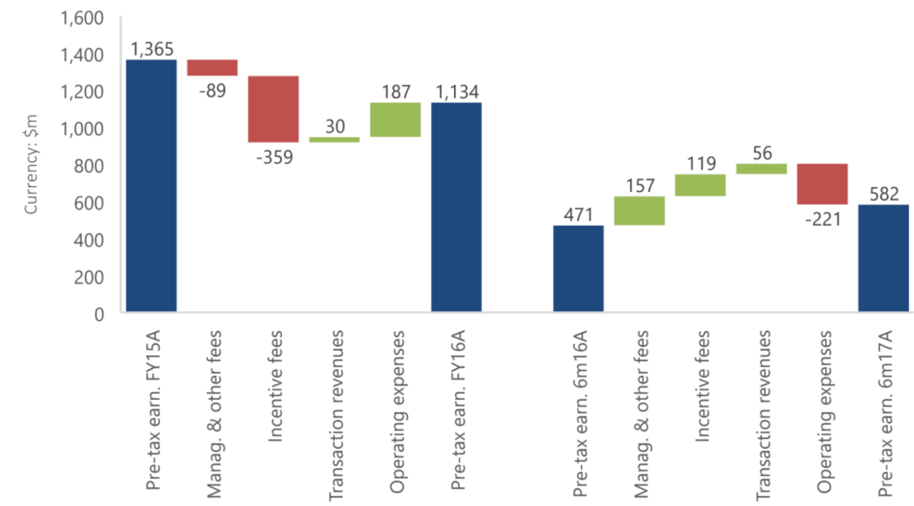
## Investment management

Revenues from IM (Figure 18) grew from $5.2bn in FY12 to $6.0bn in FY14 and $6.2bn in FY15. However, revenues decreased in FY16 to $5.8bn. This growth was mainly due to an increase in management and other fees, and a smaller contribution of transaction revenues which resulted from a surge in AUS.

Operating expenses also increased in this period but at a slower rate, from $4.3bn to $4.7bn, resulting in pre-tax earnings of $0.9bn and $1.1bn in FY12 and FY16, respectively (Figure 21).

Figure 21
Investment Management bridge FY15A-FY16A and 6m16A-6m17A

*Source: Statutory reports and FLF analysis*




## Investing & Lending

Following a great FY13, revenues of I&L (Figure 20) started to decrease. Revenues stood at $5.9bn in FY12 but declined to $4.1bn in FY16. A decline in revenues from equity securities investment of $1.3bn was the main reason for the result, even though revenues from debt securities and loans also decreased.

Operating expenses were reduced in $300m from the $2.7bn in FY12 to the $2.4bn in FY16 ensuing pre-tax earnings of $3.2bn and $1.7bn in FY12 and FY16 respectively (Figure 23).

Figure 23
Investment & Lending bridge FY15A-FY16A and 6m16A-6m17A

*Source: Statutory reports and FLF analysis*

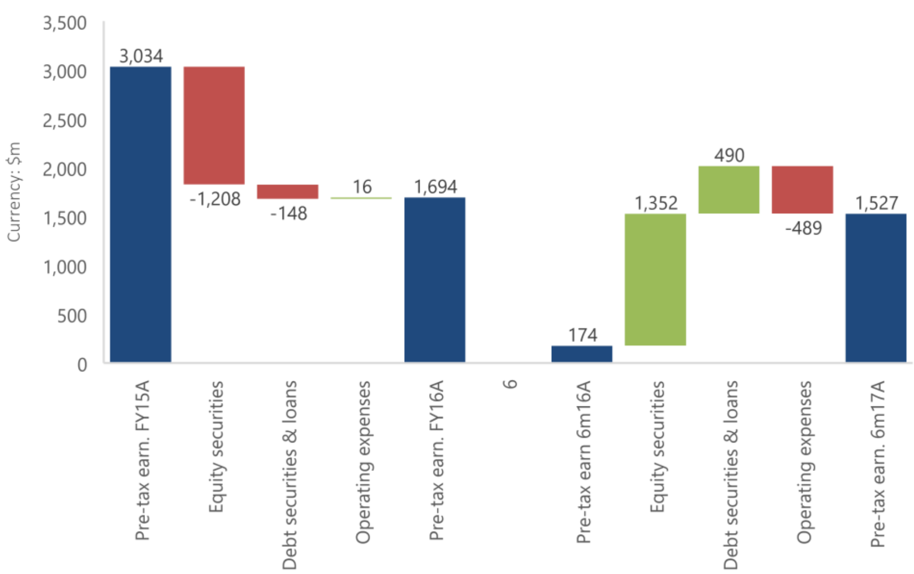



Figure 20
I&L's revenue, by source

*Source: Statutory reports and FLF analysis*

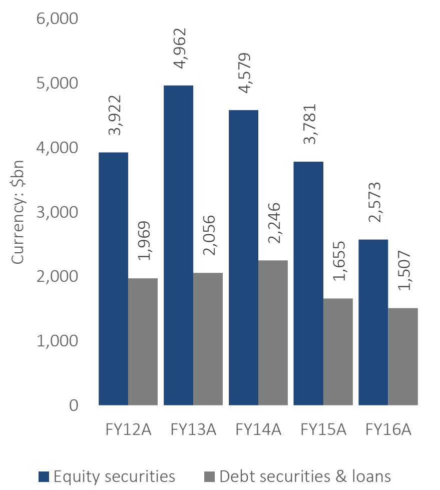



Figure 22
Consolidated revenue, by source

*Source: Statutory reports and FLF analysis*

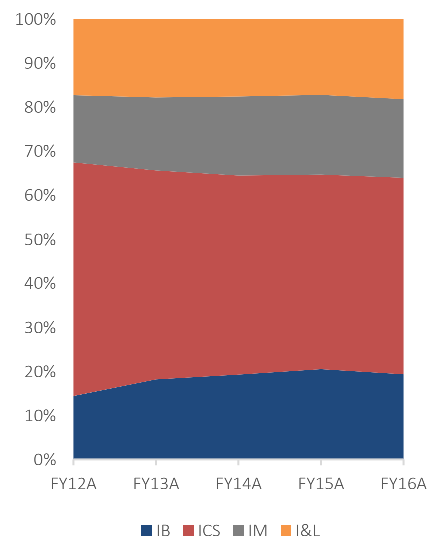
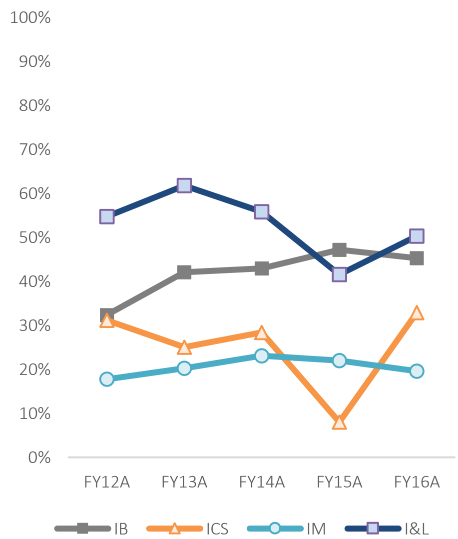



Figure 24
EBT margin

*Source: Statutory reports and FLF analysis*



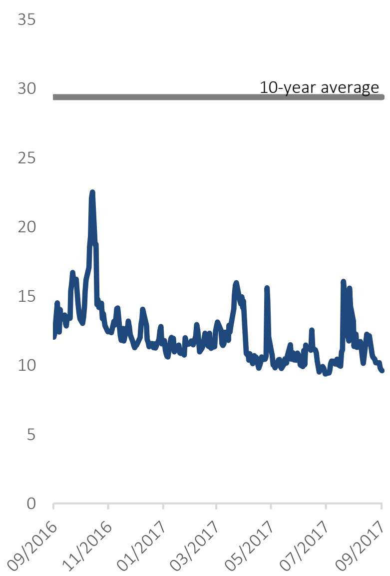
## Business segment's Outlook

We expect several main factors to impact the financial markets, especially in the U.S. and Europe, in the following years:

- Brexit negotiations started in March of 2017 and should be completed in 2019. Depending on the conditions of the deal, the economic and financial landscape in Europe might change.
- Stock valuation appears to be inflated by common metrics, such as the P/E ratio. On a cyclically adjusted basis, U.S. stocks have only been this expensive two times before – preceding the 1929 market crash and in the "dotcom" bubble. Similar situation is happening in the UK;
- The removal of stimulus (Quantitative easing) by the Federal Reserve and the European Central bank will drive global bond yields to higher levels, therefore, diminishing the attractiveness of riskier assets, such as stocks;
- Volatility – as measured by the VIX Index, computed by the CBOE (Figure 25) – as been constantly at extremely low values. Low volatility during large periods can be seen as the "calm before the storm". Empirical evidence has shown that volatility is mean reverting, however the time that it will take to revert is unknown. Hence, earnings will continue to improve consistently or stock prices will decline.

Based on these factors, we don't expect a market crash in the markets, but a correction in stock prices. This should occur during 2019, but the markets shall return to normal levels in the immediate future.

Figure 25
VIX Index 52-week performance
*Source: CBOE and FLF analysis*



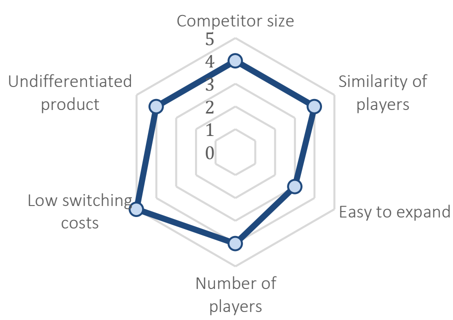

### Investment Banking

We have a moderate outlook for the Investment Banking sector (Figure 26).

After a great second half of 2015 filled with megadeals, pushing global M&A deal values to the highest level since 2007, 2016 and 2017 have seen a decrease in deal making due to uncertainty at political and economic levels in several key regions. We expect this uncertainty to carry on and, once clarity emerges in key countries, M&A activity should start to increase again. Goldman Sachs, alongside the other 4 largest U.S. investment banks, have held the largest global market share among its peers in M&A. With the increase in M&A action in China, where these banks do not hold an expressive presence, these market share will decrease leading to potentially lower revenues.

We expect IPO transactions and debt offerings to follow a similar pattern, being somewhat impacted by the ending of easy money policies in the U.S. and E.U.

Figure 26
IB industry degree of rivalry
*Source: FLF analysis*

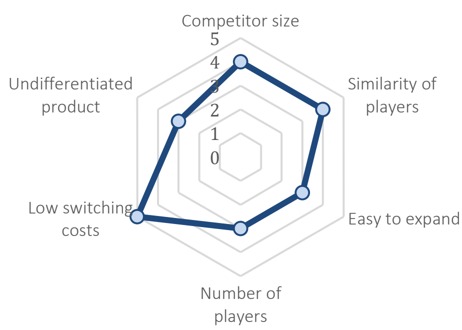



### Institutional Client Services

We maintain a moderate stance towards ICS (Figure 27).

Trading income for investment banks peaked around 2010 during the financial crisis. At this point banks had more freedom and were subject to much less regulatory constraints. Since then, much has changed: technological developments have decreased human influence; regulation separated and diminished the scope of the business; but most importantly, behavior changes – clients are more selective and the banks learned from the mistakes made in the past. From revenues around $100 billion, the twelve largest investment banks, now make $70 billion, despite the fact that the economy has grown. We expect market revenues from FICC to continue to decrease in the following years leading to an adjustment of strategies, and market

Figure 27
ICS industry degree of rivalry
*Source: FLF analysis*



orientation. Some firms will downsize or exit the market increasing the market share of the resistant companies.

Despite the low level of concentration, the brokerage industry is becoming increasingly concentrated. Technological advancements will continue to provide economies of scale and the tendency is to bundle other services provided by the firms, offering better and differentiated services to clients.

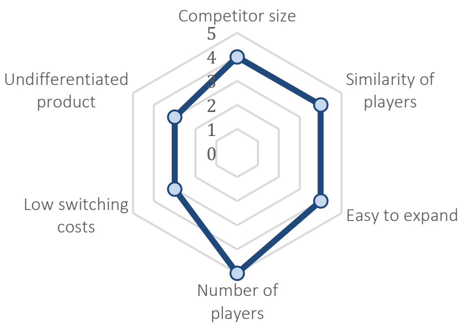
## Investment Management

Our attitude towards the future of IB is positive (Figure 28).

This is an industry that will suffer many changes in the next years, and only the most adaptable firms will succeed. The volume of investable assets is set to grow by a yearly compound growth rate of almost 6% till 2020, from the current $64 trillion to $100 trillion, due to an increase of HNWIs, SWFs and individual pension plans. Alongside the rising assets, commercial and regulatory costs of funds will rise, putting pressure on fees, technological innovation and economies of scale so that banks remain competitive. Transparency and harmonization of regulatory requirements will be progressively harmonized around the globe. Alternative investments will become less alternative and, together with passive products, will account for 35% of assets managed by the industry, as the separation between beta and alpha will lead investors to allocate higher portions of their portfolios to low fee and broader beta market exposure.

For the bank, products offered to clients will change in favor of low fee portfolios (average effective management fee will continue to decrease) and an alternative way of growing will continue to be the acquisition of smaller funds.

Figure 28
IM industry degree of rivalry
*Source: FLF analysis*




## Investing & Lending

Outlook for the I&L segment is moderate (Figure 29).

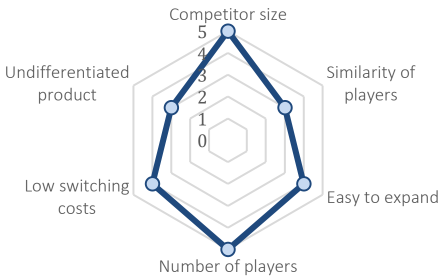
Revenues from Investing are directly dependent on market performance. Therefore, and according to our estimates stated above, we expect a decrease in revenues in the next couple of years with a recovery in the subsequent years.

A lot is changing in the retail lending landscape – demographics, greater competition, regulation and technology. Banks need to face all these challenges to thrive in the future. Choices need to be made about which markets to operate, which clients to serve and where to innovate to gain a competitive edge over the other lenders, while maintaining costs under control.

Global investments in FinTech firms are becoming more mainstream and shaking the banking industry. The traditional ways that clients have used the banks for payments, borrowing or deposit, are changing – physical presence is giving way to virtual presence. Today we can do almost everything on our smartphones on-the-go and the tendency is to move more services to mobile platforms as a form to reduce costs and reach more customers. FinTech companies have accelerated this move with innovative and more convenient products and services. Banks have slowly embraced this new reality and have now realized its necessity and potential, with both in-house technological developments and acquisition of smaller firms

We expect this tendency to continue in the following years.

Figure 29
I&L industry degree of rivalry
*Source: FLF analysis*



# Financial Analysis: Consolidated

## Profit & Loss

Total revenue from the periods FY15A-16A and 6m16A-17A saw a decrease of 9.5% ($33.8bn to $30.6bn) and increase of 11% ($14.3bn to $15.9bn), respectively. For the period ending at the end of 2016, total Non-interest revenues saw a decrease in almost all components, specially investment banking (without net interest income) and other principal transactions, of around $2.7bn. Although interest income grew by more than 14% to $9.7bn, net interest income decreased to $2.6bn caused by the expressive increase of 32% (reaching $7.1bn) in interest expense.

The biggest component (totaling 57% of total in FY16) of the operating expenses are the compensation and benefits to employees. As this is a variable expense dependent on results, it registered a decrease in FY16 of 8% to $11.6bn. Non-compensation expenses decreased $3.7bn to $8.7bn due to a decline, from an anomalous value in FY15, of other expenses. Therefore, total operating expenses declined $4.7bn to around $20.3bn.

Pre-tax earnings increased from $8.8bn to $10.3bn and net earnings from $6.1bn to $7.4bn, leading to basic EPS of $16.6 in FY16, from $12.4 in FY15.

Dividends declared totaled $2.6 per share in FY16, comparing to the $2.55 in FY15.

When comparing the first semesters of 2016 and 2017, we observe an increase of 16% in total non-interest revenues to $14.6bn and a decrease of 20% in net interest income (from $1.6bn to $1.3bn). Hence, total revenues grew to $15.9bn in the first half of 2017, a jump of 12%.

Again, compensation expenses accompanied the raise in revenues, followed also by the total non-compensation expenses. Together, increased $0.6bn reaching $10.9bn in 6m17. Pre-tax earnings soared 25% from $4.0bn to $5.0bn (Figures 30 and 31).

## Balance Sheet

Total assets closed at $860.2bn in FY16, a decrease of 0.1% from the $861.4bn in FY16. Cash and cash equivalents had a positive variation of $28.3bn mainly due to abnormal positive net cash flow from investing activities. Financing activities also provided positive cash flows in FY16, but these decreased $15.7bn mainly due to the repayment of long-term financings. The cash flows from operating activities were $5.6bn in FY16, a reduction of $2.3bn triggered by an increase in net earnings of the period and a net positive change in financial instruments sold, but not yet purchased, even though receivables and payables (excluding loans receivables) had a net negative change of $35bn, when comparing to FY15. The most significant variations in assets were the decrease in collateralized agreements ($10.4bn) and the decline of $17.6bn in financial instruments owned, at fair value, primarily due to the lower investment banking activity.

Liabilities decreased by roughly the same amount as did total assets, from $774.7bn in FY15 to $773.3bn in FY16. The main drivers for this variation were: (i) rise of 27% in deposits, totaling $124.1bn in FY16; (ii) decrease of $13.6bn in collateralized financings to $100.9bn; (iii) decrease in payables of $21.9bn; (iv) upsurge from $175.4bn in FY15 to $189.1bn of unsecured long-term borrowings.

Total shareholders' equity remained stable in FY16 at $86.9bn. In track with previous years, preferred stock was issued but a very similar amount was also redeemed maintaining the end balance of preferred stock at $11.2bn. The main components of shareholders' equity in FY16 were: additional paid-in capital ($52.6bn) – increase of

Figure 30
Consolidated EBITDA bridge FY15A
*Source: Statutory reports and FLF analysis*

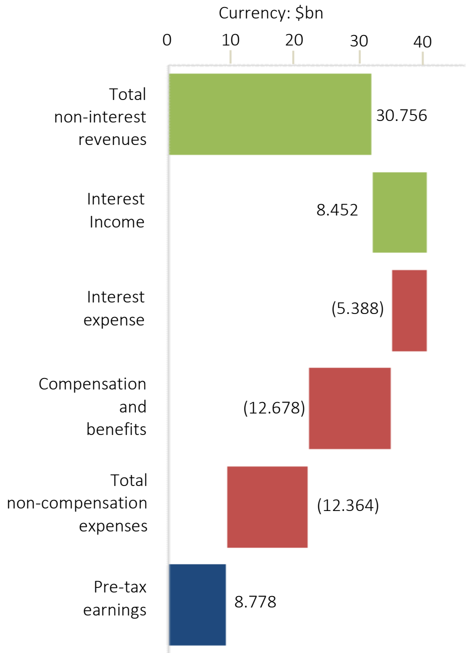
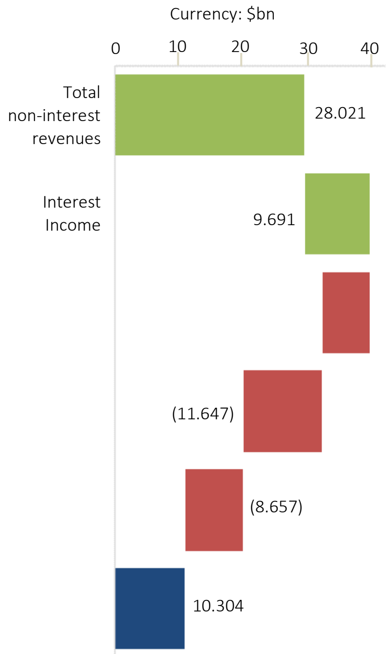



Figure 31
Consolidated EBITDA bridge FY16A
*Source: Statutory reports and FLF analysis*



$1.3bn against FY15; retained earnings ($89.0bn) – positive change of $5.7bn; stock held in treasury, at cost (($68.7bn)) – decreased $6.1bn in FY16 due to the repurchase program still in place.

Comparing total assets between 6m16 and 6m17. We observe that they improved from $896.9bn to $906.5bn. This positive variation was due to improvements in receivables and financial instruments owned, at fair value. Liabilities increased by the same amount, totaling $819.8bn at the end of the first half of 2017, with the most significant items continuing to be, in descending order, unsecured long-term borrowings, payables to customers and counterparties, financial instruments sold, but not yet purchased, and deposits. This order has been constant in the last quarters. According, to the basic accounting equation, shareholders' equity remained similar in 6m17 to 6m16. The positive increase in retained earnings was offset by a negative variation in stock held in treasury, at cost.

It is also important to mention that almost all the Balance sheet (97%) is marked to market or carried at amounts that approximate fair value, meaning that the equity reflects market value. The great part of the balance was comprised of more liquid assets, when comparing to previous periods.

## Regulatory Capital

The Group is subject to the Federal Reserve Board's revised risk-based capital and leverage regulations, including some transitional provisions (the Revised Capital Framework). This RCF is based mostly on Basel III, plus some provisions from de Dodd-Frank Act and, under it, GS is considered an "Advanced approach" banking organization and a global systemically important bank (G-SIB). With the implementation of the RCF, three additional capital ratio requirements, that phase over time, were introduced. These additional capital ratio requirements must be satisfied totally with capital that qualifies as CET1: (i) the capital conservation buffer, that began to phase-in on January 1, 2016 and will continue to do so in raises of 0.625% per year until January 1, 2019, when it will reach 2.5% of RWA's; (ii) the G-SIB buffer, that has the same timeline to be fully phase-in, applies only to G-SIB institutions and is set at 2.5%; (iii) the counter-cyclical buffer, of up to 2.5%, is designed to counteract systemic vulnerabilities and applies only to "Advanced approach" banking organizations – it is currently set at 0%. The standardized approach to calculate RWAs was also revised by the Basel Committee.

Goldman Sachs is, and has been, in a comfortable position in terms of capital adequacy. All ratios are at a safe distance from minimum requirements (Figure 32) and, in a Basel III Advanced approach, have increased since FY12 to current levels (Table 11). The Tier 1 Leverage ratio, which is calculated by dividing Tier 1 Capital by the average TA (consolidated), is more than two times what is required by the authorities – was 9.4% in FY16. Basel III Advanced RWA's, on the other hand, decreased from $577.7bn in FY15 to $549.7bn in FY16.

Both the Group and all banking subsidiaries, individually and at consolidated level, are subject to national capital requirements and failure to meet the minimum regulatory capital levels could result in limitations on the ability of the firm to make certain compensation payments and distribute capital in the forms of dividends or share repurchases (Appendix G)

Table 2
FY16 Key metrics
*Source: Company presentation*

| | FY16 | YoY Δ |
|---|---|---|
| Net Revenues | $30.6bn | (9%) |
| Pre-Tax Earnings | $10.3 | +17% |
| Net Income | $7.4bn | +22% |
| Diluted Eps | $16.29 | +34% |
| ROE | 9.4% | +200bps |
| BVPS | $177.09 | +6.7% |

Table 10
6m17 Key metrics
*Source: Company presentation*

| | 6m17 | YoY Δ |
|---|---|---|
| Net Revenues | $15.9bn | +12% |
| Pre-Tax Earnings | $5.0bn | +25% |
| Net Income | $4.1bn | +38% |
| Diluted Eps[2] | $9.10 | +42% |
| Annualized ROE[2] | 10.1% | +260bps |
| BVPS | $187.32 | +6% |

Figure 32
Minimum Capital Requirements
*Source: Basel Committee and Statutory reports*

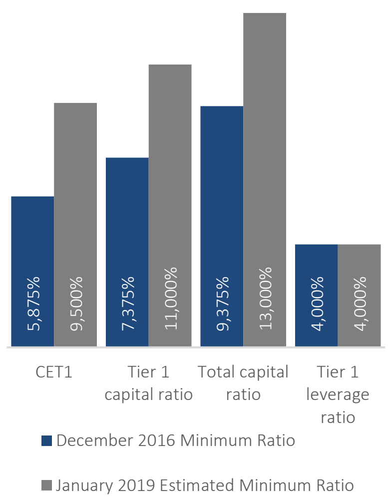



Table 11
Capital Ratios – FY16 and 6m17
*Source: Statutory reports*

| | FY16 | 6m17 |
|---|---|---|
| **CET1 ratio** | | |
| Standardized | 14.0% | 13.5% |
| Basel III Advanced | 12.7% | 12.2% |
| **Tier 1 capital ratio** | | |
| Standardized | 16.1% | 15.5% |
| Basel III Advanced | 14.6% | 14.1% |
| **Total capital ratio** | | |
| Standardized | 19.1% | 18.2% |
| Basel III Advanced | 17.2% | 16.3% |

[2] 6m17 included a $485mm reduction to provision for taxes as a result of the firm's adoption of the share-based accounting standard, resulting in an increase to diluted EPS of $1.16 and annualized ROE of 1.3%

# Forecast procedures

## Revenue

We estimated revenue separately to the four business segments and then consolidated them to reach the total revenues for the group. To forecast all variables, we took into consideration the historical data and its dynamics present in the statutory reports, management predictions, economic trends and the understanding of future trends by market analysts (Figure 33 through 36).

Investment Banking revenues depend greatly in the dynamics in M&A, and debt and equity issuances. Therefore, we forecasted revenues for this segment based on historical performance and the expected developments in these areas;

IM's revenues are dependent on AUS. We forecasted AUS, based on the experts' expectations of future developments in the asset management industry, and derived the revenues for this segment;

Investing & Lending revenues were regressed based on historical data adjusted to the market assumptions present in this report;

ICS's revenues were also regressed based on historical data and future expectations. We analyzed carefully the FICC revenues due to its relevance, by researching how management plans and future trends were interpreted by analysts. We incorporated these opinions in our forecasts.

The forecast for the Net Interest Income took into consideration the amount in deposits and loans in previous years, and the expected effects of the new products and services offered by the bank.

## Operating Expenses

The primary component of operating costs is compensation and benefits. This item, alongside professional fees are dependent on revenues, thus, we forecasted them based on our revenues forecast and assuming total staff at period-end at 34.100 from FY17F till FY21F (average from previous years supported by dynamics in 6m17). The remaining operating expenses were regressed based on historical trends and both historical and forecasted revenues.

## Equity capital structure

We believe that the current programs of common share repurchase and issuance of preferred stock will continue in the foreseeable future. Preferred dividends were calculated based on existing classes (and corresponding rates) and expected increase in central bank interest rates that will impact the variable component of dividends paid.

All information present in the report was taken into consideration while forecasting the financials of the group (Appendices A through F).

Figure 33
IB revenue forecast
*Source: Statutory reports and FLF analysis*

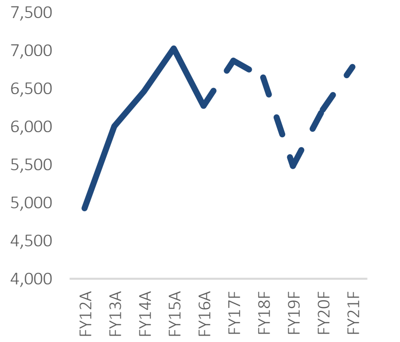



Figure 34
ICS revenue forecast
*Source: Statutory reports and FLF analysis*

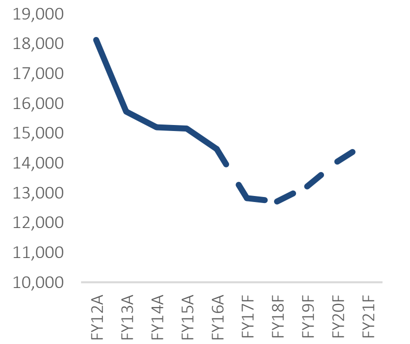



Figure 35
I&L revenue forecast
*Source: Statutory reports and FLF analysis*

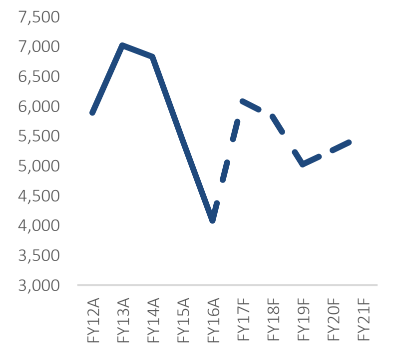
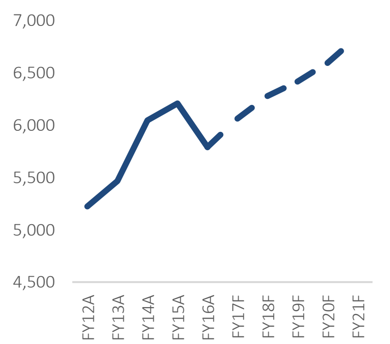



Figure 36
IM revenue forecast
*Source: Statutory reports and FLF analysis*



# Valuation Methodologies

Valuing financial service firms is different from valuing non-financial service firms, and can pose a challenge. There are several explanations for this: firstly, the regulation present in the financial sector is much higher than in other sectors, and the effects of these requirements must be considered; secondly, the nature of the business makes it extremely difficult to forecast future cash-flows, as the definitions of reinvestment and debt are unclear.

Financial service firms can be divided into four different large groups: banks; insurance companies; investment banks and investment firms – some companies can several groups. This is the case of Goldman Sachs that has the banking, investment banking and investment segments, increasing the complexity of this valuation.

A company applies its capital, usually debt and equity, raised from creditors and shareholders respectively, in order to invest in assets. So, when conducting such valuation, we tend to focus on the value of assets, or the enterprise value, and not equity. For a FSF, debt does not take the usual connotation, instead of a source of capital, it can be seen as raw material. The definition of what constitutes raises questions like whether or not deposits should be treated as debt by the bank. And in the case of interest bearing deposits, the difference between those deposits and debt issued by the bank has very little dissimilarities. Thus, if we characterized customer deposits as debt, we should calculate the operating income before interest paid to deposits – and we would be discarding a large portion of the banks' revenues from normal operations. Hence, capital, for FSFs should just include equity capital.

Financial service firms are also highly regulated all around the world, with differences only in the degree of regulation imposed, and face several constraints: FSFs have minimum capital ratios that are required to maintain at every moment, in order to guarantee that the firm does not scale up more than it can afford and that the interests of all stakeholders, including depositors and shareholders are not at risk; legislation, like the Volcker Rule present in the Dodd-Frank Act in the U.S. or the MiFID II in the EU, which limits where they can invest their funds; new entries or mergers and other operations are heavily scrutinized by the regulators.

In terms of capital expenditure, FSFs invest more in intangibles assets, such as human capital, compared to the investments in factories and equipment (fixed tangibles assets). Meaning that the major part of investments for the future is disclosed in the financial statements as operating expenses. Accordingly, the statement of changes in cash-flows presents low amounts of CapEx and depreciation. Furthermore, working capital is much more volatile in FSFs than it is in the non-financial service firms. Due to this difficulty in determining reinvestment, we are faced with some obstacles when valuing Goldman Sachs: we cannot estimate cash flows and expected future growth rate without estimating reinvestment. And as demonstrated, this is extremely difficult.

We usually value a firm by discounting expected cash flows before debt payments at the WACC rate. Given all constrains and specifications described above, it was necessary to use different ways to value GS. One approach is the equity approach. We would discount an equity related variable with the cost of equity, and apply this approach to the multiples valuation by using price multiples (like P/E and Price to book ratios) instead of value ratios such as Value to EBITDA.

The initial idea was to value the company's different geographies individually, and then consolidate the data to obtain the valuation of The Goldman Sachs Group Inc. This would be the best way to value the group, given they face different market environments – different economic situations, market conditions or even different competitors, although the business is the same from America to Asia passing through Europe. Goldman does not supply enough geographical data to pursue this approach and, as stated above, because the multiples valuation should be done with price multiples we can only apply them in a consolidated manner. This situation adds forecasting and valuation constraints as we cannot ponder the different stages of the different businesses of the Group.

After establishing that the valuation would be done at a consolidated level, the main methods to be used in the valuation were analyzed. The initial idea was to use a DCF approach by discounting FCFEs using the cost of equity as discounting rate. According to Damodaran, FCFE = Net Income – Increases in Regulatory Capital. Regulatory minimum capital requirements were defined recently in the Basel III agreements and will be fully phased-in the beginning of 2018. Although we can assume that they will remain constant in the time horizon analyzed in this research, to forecast the necessary increases or the deliberate changes done by management is extremely difficult.

An alternative was to apply an Excess Return method of valuation. With this model, Value of Equity = Equity Capital invested currently + PV of Expected future returns to Common Equity investors. The key concept here is Excess return – a firm that earns the fair-market rate of return on equity investments should see the market value of its equity converge to the equity capital currently invested, and a company earning an above-market return should see its equity market value raise above the equity capital currently invested.

Given the complexity of the business and difficulties of forecasting future capital needs of the bank, it makes more sense to use an excess return model to estimate the value of equity (Appendix H).

To apply this model, we need a measure of equity capital currently invested and the expected excess returns to common equity investors in future periods. We forecasted and used the book value of equity of the bank subtracted by the preferred stock equity, as a measure of equity capital currently invested. We selected this measure for two reasons: assets of GS are almost all marked up to market; depreciations are insignificant for in the financials. The current programs of stock buybacks and issuance of preferred stock are considered in the analysis. Net earnings to common equity shareholders was considered a good measure of returns on common equity and economic return earned on equity investments. To reach the excess equity return, we subtracted from the forecasted net earnings to common equity shareholders in every forecasted year, the amount of cost of equity (cost of equity rate multiplied by average Book value of common equity) of that year. At the final forecasted year we computed a terminal value following an approach similar to the Gordon model (not applied to dividends). To reach the PV of Excess return, the computed values were then discounted to YE18 using the cost of equity. The price target is the sum of the average book value of equity for 2018 plus the PV of excess return calculated, divided by the number of outstanding shares at that date.

## Calculation of the Discount Rate

As mentioned above, the discount rate to be applied in this valuation is the cost of equity. To determine the cost of equity ($R_e$), we used the Capital Asset Pricing Model (CAPM). This model describes the relationship between expected return for a security and its systematic risk:

$$R_e = R_f + \beta \times (R_m - R_f)$$

According to CAPM, investors are compensated in two ways: the time value of money and risk assumed. The time value of money is given by the risk-free rate – the rate of return that an investor expects for placing his funds in any investment over a period. The risk component is obtained by multiplying a measure of systematic risk (Beta) and the market risk premium – surplus return of the market comparing to the risk-free rate.

- Risk-free rate: It should be the rate of return of an investment with zero risk. This is a theoretical rate of return. Consequently, it is the minimum rate of return an investor expects for a given investment. Because such rate does not exist in the real world (even the safest investment come with a small amount of risk), we decided to use a proxy rate of return. We have chosen the 10-year Treasury bond's yield for the United States Government. It is considered a AAA credit rating, the highest rating denoting the strongest creditworthiness relative to other domestic issuers. This rate was 2.22% at 05-10-2017 (Bloomberg L.P.).

- Beta (β): The calculation of Betas of financial firms needs also to be addressed differently of those of non-financial firms. Subsequently, we used bottom-up betas instead of regressed ones due to two reasons: (i) large probability that the firm has changed over the period of the regression; (ii) noise present in the estimates. Also, we did not adjust for financial leverage, as all FSFs tend to have similar financial leverage (capital structure) mainly due to regulatory constraints and, as mentioned above, debt is very difficult to quantify when valuing these firms. Hence, we used the levered beta for comparable firms as the bottom-up beta for Goldman Sachs, instead of using unlevered betas and then relevering them using the current debt to equity ratio. When deciding which firms to use as comparable, the size, sector and domicile were key factors, given that for instances an investment bank in the United States has a different risk of a regional lender in Brazil. It is important to hold the significant impact that regulations have on the betas of FSFs. With an increase of regulatory constraints, it is expected that the betas decrease to values close to 1 and get further away from 1 if they decrease. Although there is the determination to abolish some regulations, like the "Volcker Rule", in some legislators, we assumed that the level of regulation will remain unchanged in the next years. For all the reasons stated above, we computed the Beta of Goldman Sachs as the average of betas of the comparable companies also applied to the multiples valuation, and reached a Beta of 1.199 (criteria followed to select the comparable firms in the following sections).
- Market Risk Premium: Damodaran obtains the total equity risk premium by looking at the implied premium for the S&P 500. This total equity risk premium is the market risk premium for a mature market (like the US market), assuming sustainable payout. The current rate is 4.50%.

We also thought of adding an industry risk premium (IRP) and country risk premium (CRP) but decided against as the calculation of beta already takes into consideration the industry (it's an average containing most of the big players of the industry) and the CRP is zero, according to Damodaran.

The Total estimated Cost of Equity is 7.64%. Value that is comparable to those applied by market analysts to comparable companies.

## Terminal Value

The Terminal Value denotes the future value of a business beyond the projected period until perpetuity, which is then discounted to present value at a discount rate. TV was calculated by multiplying the expected return of FY21F by the terminal growth rate, subtract amount of cost of equity and then divide by the difference between the cost of equity and the terminal growth rate.

The terminal growth rate was set at 1.80% in perpetuity. Given that Goldman Sachs has a strong position in a mature industry, the rate was based on the IMF's forecast for the main countries where GS is present. Additionally, the expected returns of existing investments have also been taken into consideration.

## Discount Convention

We applied the commonly accepted mid-year convention used by financial analysis professionals to discount. Instead of assuming that results or cash-flows occur only at the end of each year, this convention states that they occur in the middle of the year, allowing for a more realistic analysis.

## Valuation period

We considered a limited period ranging from the base date 31st December 2017 and 31st December 2021, with the terminal value being added at the end of this period. We considered this period, even though according to the maturities of both company and industry, from a theoretical point of view, the valuation period would extend to infinity. For longer periods would be very difficult to forecast all the necessary parameters.

## Multiples

The comparable firms were selected from an initial sample of 150.535 companies in the financial sector. This sample was retrieved from Bloomberg and outliers were eliminated. To reach our final sample of comparable firms, other criteria were set to eliminate companies, such as:

- Be a diversified bank, guaranteeing that the FSFs compete in several businesses that GS is present because, as stated above, our approach is to value the Group at a consolidated level;
- The firm must be listed inside the U.S. and report under the U.S. GAAP. These criteria remove from the sample globally present investment banks (Barclays Bank PLC and Deutsche Bank AG, to name a few) that could be relevant for our analysis, but eliminates the issue of comparing firms that follow different reporting standards;
- Presence in North America and Europe. To capture the risk and opportunities that Goldman Sachs faces by being present in all major financial centers;
- Market capitalization greater than $10.0bn, to safeguard that the comparable firms have a considerable size and reduce possible distortions in the analysis due to size effect;
- We applied several criteria to remove duplicates and inactive securities to reduce our sample while not compromising the validity of the sample.

At this point, we were left with a reasonable amount of potentially comparable firms.

To value Goldman Sachs through market approach, we did not consider the common metrics applied to this type of valuation for all the reasons mentioned in previous sections, and applied price earnings: Price to Book ratio and the Price Earnings Ratios for both FY16A and FY17F. These multiples were proposed by Damodaran and, in our opinion, allow us to perform this valuation taking into account all the specifications of GS and its business (Appendix I).

# Investment Risks

## Market Risk

It can be decomposed in the risks listed below, and measured by several techniques such as Value at Risk (VaR) (Figure 37) and sensibility analysis. Goldman Sachs defines VaR as "the potential loss in value due to adverse market movements over a defined time horizon with a specific confidence level", and the bank typically employs a one-day time horizon with a 95% confidence level. The model captures the overall market risk and is applied at a firm-wide level to allow for the determination of the cumulative risks from aggregated positions held by different divisions within the bank. Since VaR presents some limitations, GS uses a variety of risk measures in the market risk management process, like stress testing, risk limits and sensitivity measures.

## Market Risk: Interest rate risk (MR1, Figure 38)

Results from exposure to changes in the level, slope and curvature of yield curves, volatilities of interest rates, mortgage prepayment speeds and credit spreads. Interest rates set by central banks impact prices of securities, like stock or bonds, and the spreads in loans and deposits of the bank. It also influences the borrowings that the bank has that are indexed to a float rate.

## Market Risk: Equity price risk (MR2, Figure 38)

As part of the its business, the bank lends money to clients and can accept equity as collateral, and invest in the capital markets. As stated, around 90% of the balance of the bank is marked at market price. Therefore, any negative change in stock price either leads to a loss or diminution in investments' value, affecting the financial statements.

## Market Risk: Currency rate risk (MR3, Figure 38)

The bank is present in all major financial centers around the globe and transacts, for itself or on behalf of its clients, in all currencies. This risk is the potential loss due to variations in the value of the banks' assets and liabilities resulting from exchange rate fluctuations. Currency translation represented losses of $69m and $140m in FY16 and FY15, respectively.

## Market Risk: Commodity price risk (MR4, Figure 38)

It results from exposures to variations in forward prices, spot prices and volatilities of commodities, such as natural gas, crude oil or precious metals. In the ICS segment, the bank trades and makes markets, hence unexpected changes in commodity prices can reduce margins and earnings for the bank.

## Market Risk: Credit risk (MR5, Figure 38)

It represents the potential loss due to the default or deterioration in credit quality of a counterparty – can be borrowers or OTC counterparties, for example – or an issuer of securities. It can also arise from cash placed with banks, securities financing transactions (securities borrowing, lending activities or resale and repurchase agreements) and receivables from customers, counterparties, dealers, brokers and clearing organizations (Table 12). Credit Risk Management is independent from revenue-producing units, reports to the chief risk officer and has the main responsibility in assessing, monitoring and managing credit risk (Appendices J and L).

Figure 37
Average Daily VaR
*Source: Statutory reports*

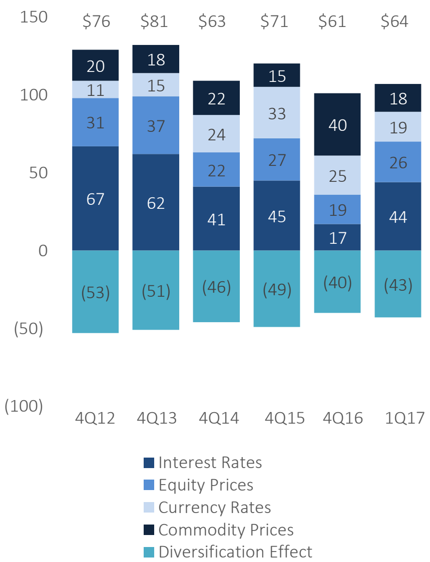



Figure 38
GS's Risk Matrix
*Source: FLF analysis*

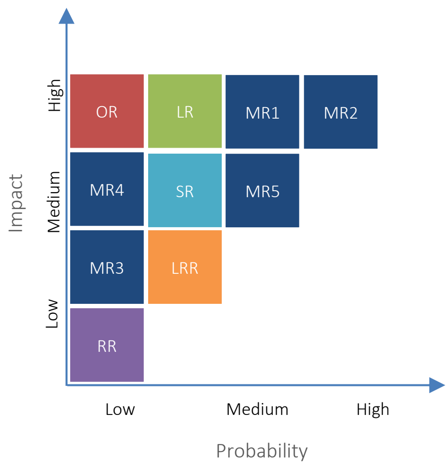



Table 12
GS's Credit exposure, by type and region
*Source: Statutory reports and FLF analysis*

| $ in millions | 6m17 | FY16 |
|---|---|---|
| Cash | $92.300 | $107.100 |
| OTC Derivatives | 46.500 | 51.100 |
| Loans and lending commitments | 170.300 | 154.200 |
| **Total** | **$309.100** | **$312.400** |
| Americas | $193.900 | $215.200 |
| EMEA | 94.400 | 77.600 |
| Asia | 20.800 | 19.600 |
| **Total** | **$309.100** | **$312.400** |

Operational Risk (OR, Figure 38)

It is the risk of loss resulting from inadequate or failed systems, people and internal processes, or from external events. Risks related to operations beyond the scope of Law and regulations are also operational risks. To measure and manage this risk, the firm combines bottom-up (revenue-producing units, support functions and independent control are responsible for risk identification and management on a day-to-day basis) and top-down approaches. In the latter, the senior management assesses business-level and firmwide risk profiles. This framework has changed and will continue to change to adapt to regulatory changes and business dynamics. Internal audit performs an independent review of the framework.

Liquidity Risk (LR, Figure 38)

Liquidity is of critical importance to Goldman Sachs. The great majority of failures in FSF's have occurred in large part due to insufficient liquidity. This is the risk that the bank won't be able to fund itself and meet liquidity requirements in the event of broader industry, market liquidity or firm-specific stress events. GS applies several frameworks to manage its liquidity risk like the Asset-Liability Management, Contingency Funding Plan and the GCLA. The latter is based on an internal liquidity model together with a qualitative assessment of condition of the firm and markets, to meet a broad range of potential cash outflows and collateral stressed environment. GCLA (Table 13) is comprised of cash, high quality and narrowly defined unencumbered assets, like U.S. Treasuries and U.K., Japanese, German and French Government obligations. It represents around 25% of the Balance Sheet (6m17A).

Table 13
Decomposition of GCLA – 6m17A
*Source: Statutory reports*

| | GCLA and Cash |
|---|---|
| Cash and Equivalents | $92.251 |
| Securities purchased under agreements to resell and federal funds sold | 58.688 |
| Securities borrowed | 35.641 |
| Financial instruments owned | 44.977 |
| Total | $231.557 |

Reputational Risk (RR, Figure 38)

Goldman Sachs knows this risk better than most financial firms. When, for example, the S.E.C. charged GS with fraud in 2010, its market cap fell by $12.4bn in one day – more than 15,00%. This risk is still considerable, however lower having in mind the current regulations and sentiment towards GS.

Systemic Risk (SR, Figure 38)

This type of risk can lead to very stressing scenarios – like what happened in the 2008 crisis across the world. It refers generally to the risk that the entire financial system come to a halt or the failure of one financial institution affecting other institutions and the stability of the system, as a whole. The VIX Index can be a good proxy for the systemic risk.

Legal and Regulatory Risks (LRR, Figure 38)

In the aftermath of the financial crisis, the banks in the U.S. and Europe faced many law suits leading to huge amounts in settlements and fines, some of which are not over yet. Legal risk takes the form of financial loss resulting from the bank applying wrongly the Law and legal suits filed against the bank.

Regulatory risk arises from changes in regulations that lead to financial loss for the bank.

# Risks to price target analysis

## Sensitivity analysis

With the purpose of measuring possible changes in FY18 price target due to variations on some variables, we conducted a sensitivity analysis recurring to the Crystal Ball software. For this analysis, 100.000 possible scenarios were evaluated. In each scenario, different combinations of variables were tested to assess which variables have the greatest impact in the price target if base assumptions were not observed.

We determined that the variables that created the greatest effect in the price target were: market risk premium; Beta; Risk-free Rate; and Terminal Growth Rate (Figure 39). The two first variables were subject to more assessment (Tables 15 and 16).

Table 15
GS's valuation sensitivity analysis

| Risk-free rate | Market risk premium | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3.00% | 3,50% | 4,00% | 4.50% | 5.00% | 5,50% | 6,00% |
| 1,62% | 392,07 | 334,29 | 291,07 | 257,38 | 230,27 | 207,91 | 189,08 |
| 1,82% | 370,73 | 318,56 | 278,94 | 247,71 | 222,36 | 201,29 | 183,43 |
| 2,02% | 351,57 | 304,2 | 267,74 | 238,69 | 214,91 | 195,01 | 178,05 |
| 2,22% | 334,25 | 291,03 | 257,35 | 230,25 | 207,90 | 189,07 | 172,93 |
| 2,42% | 318,52 | 278,91 | 247,69 | 222,34 | 201,27 | 183,42 | 168,04 |
| 2,62% | 304,17 | 267,71 | 238,67 | 214,90 | 195.00 | 178,04 | 163,36 |
| 2,82% | 291.00 | 257,33 | 230,23 | 207,88 | 189,05 | 172,92 | 158,88 |

*Source: FLF analysis*

Table 16
GS's upside potential sensitivity analysis

| Risk-free rate | Market risk premium | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3.00% | 3,50% | 4,00% | 4.50% | 5.00% | 5,50% | 6,00% |
| 1,62% | 61,65% | 37,82% | 20,00% | 6,11% | -5,06% | -14,28% | -22,04% |
| 1,82% | 52,85% | 31,34% | 15,00% | 2,13% | -8,32% | -17,01% | -24,37% |
| 2,02% | 44,95% | 25,42% | 10,39% | -1,59% | -11,40% | -19,60% | -26,59% |
| 2,22% | 37,81% | 19,99% | 6,10% | -5,07% | -14,29% | -22,05% | -28,70% |
| 2,42% | 31,32% | 14,99% | 2,12% | -8,33% | -17,02% | -24,38% | -30,72% |
| 2,62% | 25,41% | 10,37% | -1,60% | -11,40% | -19,60% | -26,60% | -32,65% |
| 2,82% | 19,98% | 6,09% | -5,08% | -14,29% | -22,06% | -28,71% | -34,50% |

*Source: FLF analysis*

Notes to figure:
Green, grey, yellow and red stand for Buy, Neutral, Reduce and Sell, respectively.

## Monte Carlo simulation

To complement the sensitivity analysis, we performed a Monte Carlo simulation (Figure 2 and Table 17), using Crystal Ball, to test sensitivity of the YE18 price target to the previously identified variables. We ran 100.000 simulations.

We reached a mean price target of $236.99, a median of $231.15 and a related standard deviation of $42.67, with a 95.0% confidence level. The results conclude that there is a 95% probability that the YE18 price target for the Goldman Sachs is between $171.88 and $337.18.

To perform this simulation, we assumed a normal distribution for all variables and a respective standard deviation of 0.12 for the Beta, 0.4% for the risk-free rate, 0.5% for the market risk premium and 0.8% for the terminal growth value. The reasoning for these standard deviations are, respectively: 10% of the computed value for Beta; derived from the STD of 10-year Treasury bond's yield for the United States Government; derived from the STD of historical risk premium values; derived from the STD of the S&P Financial Index.

Table 14
Investment rating, by risk
*Source: BPI Rating Scheme*

| | Low risk | Medium risk | High risk |
|---|---|---|---|
| Buy | > 15% | > 20% | > 30% |
| Neutral | > 5% & < 15% | > 10% & < 20% | > 15% & < 30% |
| Reduce | > (10%) & < 5% | > (10%) & < 10% | > (10%) & < 15% |
| Sell | < (10%) | < (10%) | < (10%) |

Figure 39
YE18 Price Target Sensitivity
*Source: Crystal Ball software and FLF analysis*

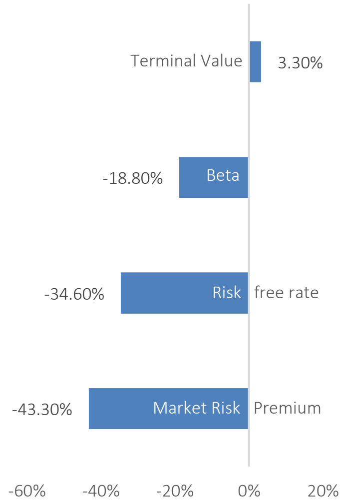



Figure 2
Monte Carlo price distribution
*Source: Crystal Ball software and FLF analysis*

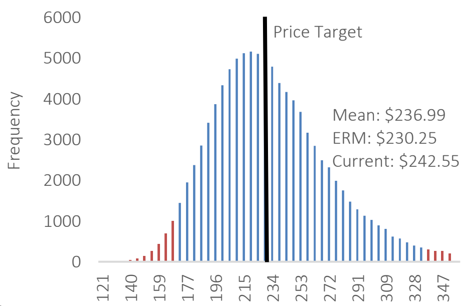



Table 17
Monte Carlo price percentiles
*Source: Crystal Ball software and FLF analysis*

| Percentile | Forecast values | Upside Potential |
|---|---|---|
| 0% | $ 120,90 | (50,15%) |
| 10% | 189,55 | (21,85%) |
| 20% | 202,52 | (16,50%) |
| 30% | 212,65 | (12,33%) |
| 40% | 221,79 | (8,56%) |
| 50% | 231,15 | (4,70%) |
| 60% | 241,09 | (0,60%) |
| 70% | 252,51 | 4,11% |
| 80% | 267,05 | 10,10% |
| 90% | 290,63 | 19,82% |
| 100% | 856,26 | 253,02% |

Table 18: Statement of Financial Position (Consolidated)

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Assets** | | | | | | | | | | |
| Cash and cash equivalents | $ 122.340 | $ 110.804 | $ 109.316 | $ 93.439 | $ 121.711 | $ 140.229 | $ 139.918 | $ 144.897 | $ 160.739 | $ 162.132 |
| Collateralized agreements: | | | | | | | | | | |
| Securities purchased under agreements to resell and federal funds sold | 141.334 | 161.732 | 127.938 | 134.308 | 116.925 | 107.931 | 98.253 | 88.576 | 78.899 | 74.221 |
| Securities borrowed | 136.893 | 164.566 | 160.722 | 177.638 | 184.600 | 191.071 | 197.704 | 204.338 | 210.971 | 217.605 |
| Receivables: | | | | | | | | | | |
| Brokers, dealers and clearing organizations | 18.480 | 23.840 | 30.671 | 25.453 | 18.044 | 17.901 | 16.933 | 16.865 | 16.497 | 15.029 |
| Customers and counterparties | 58.299 | 74.040 | 63.808 | 46.430 | 47.780 | 46.346 | 47.090 | 46.833 | 38.077 | 37.845 |
| Loans receivable | 14.575 | 14.895 | 28.938 | 45.407 | 49.672 | 63.185 | 78.045 | 91.905 | 105.765 | 119.625 |
| Financial instruments owned, at fair value | 407.011 | 339.121 | 312.248 | 313.502 | 295.952 | 280.870 | 268.827 | 255.784 | 245.742 | 234.699 |
| Other assets | 39.623 | 22.509 | 22.201 | 25.218 | 25.481 | 26.785 | 27.857 | 28.930 | 30.002 | 31.074 |
| **Total assets** | **$ 938.555** | **$ 911.507** | **$ 855.842** | **$ 861.395** | **$ 860.165** | **$ 874.318** | **$ 874.627** | **$ 878.128** | **$ 886.692** | **$ 892.230** |
| **Liabilities and shareholders' equity** | | | | | | | | | | |
| Deposits | 70.124 | 70.807 | 82.880 | $ 97.519 | $ 124.098 | 139.331 | 153.065 | 166.799 | 180.533 | 194.267 |
| Collateralized financings: | | | | | | | | | | |
| Securities sold under agreements to repurchase, at fair value | 171.807 | 164.782 | 88.215 | 86.069 | 71.816 | 69.234 | 63.877 | 61.519 | 59.162 | 56.805 |
| Securities loaned | 13.765 | 18.745 | 5.570 | 3.614 | 7.524 | 7.743 | 8.488 | 9.232 | 9.976 | 10.721 |
| Other secured financings | 32.010 | 24.814 | 22.809 | 24.753 | 21.523 | 21.423 | 20.575 | 19.728 | 18.880 | 18.033 |
| Payables: | | | | | | | | | | |
| Brokers, dealers and clearing organizations | 5.283 | 5.349 | 6.636 | 5.406 | 4.386 | 4.092 | 3.651 | 4.210 | 4.768 | 3.827 |
| Customers and counterparties | 189.202 | 199.416 | 206.936 | 204.956 | 184.069 | 183.113 | 177.790 | 172.467 | 167.144 | 161.821 |
| Financial instruments sold, but not yet purchased, at fair value | 126.644 | 127.426 | 132.083 | 115.248 | 117.143 | 118.087 | 113.781 | 111.407 | 111.877 | 112.503 |
| Unsecured short-term borrowings, including the current portion of unsecured long-term borrowings | 44.304 | 44.692 | 44.539 | 42.787 | 39.265 | 37.865 | 36.004 | 34.142 | 32.281 | 30.419 |
| Unsecured long-term borrowings | 167.305 | 160.965 | 167.302 | 175.422 | 189.086 | 191.268 | 194.656 | 196.043 | 198.431 | 200.818 |
| Other liabilities and accrued expenses | 42.395 | 16.044 | 16.075 | 18.893 | 14.362 | 14.970 | 14.293 | 13.354 | 12.957 | 10.690 |
| **Total liabilities** | **$ 862.839** | **$ 833.040** | **$ 773.045** | **$ 774.667** | **$ 773.272** | **$ 787.126** | **$ 786.180** | **$ 788.901** | **$ 796.009** | **$ 799.904** |
| **Shareholders' equity** | | | | | | | | | | |
| Preferred stock, par value $0.01 per share | 6.200 | 7.200 | 9.200 | 11.200 | 11.203 | 12.203 | 13.203 | 14.203 | 15.203 | 16.203 |
| Common stock, par value $0.01 per share | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| Share-based awards | 3.298 | 3.839 | 3.766 | 4.151 | 3.914 | 3.014 | 2.322 | 1.655 | 881 | 11 |
| Nonvoting common stock, par value $0.01 per share | - | - | - | - | - | - | - | - | - | - |
| Additional paid-in capital | 48.030 | 48.998 | 50.049 | 51.340 | 52.638 | 53.987 | 55.456 | 57.046 | 58.756 | 60.586 |
| Retained earnings | 65.223 | 71.961 | 78.984 | 83.386 | 89.039 | 94.316 | 99.527 | 104.308 | 109.409 | 114.787 |
| Accumulated other comprehensive loss | (193) | (524) | (743) | (718) | (1.216) | (1.747) | (1.980) | (2.404) | (2.483) | (2.674) |
| Stock held in treasury, at cost, par value $0.01 per share | (46.850) | (53.015) | (58.468) | (62.640) | (68.694) | (74.590) | (80.090) | (85.590) | (91.092) | (96.595) |
| **Total shareholders' equity** | **$ 75.716** | **$ 78.467** | **$ 82.797** | **$ 86.728** | **$ 86.893** | **$ 87.192** | **$ 88.447** | **$ 89.227** | **$ 90.683** | **$ 92.326** |
| **Total liabilities and shareholders' equity** | **$ 938.555** | **$ 911.507** | **$ 855.842** | **$ 861.395** | **$ 860.165** | **$ 874.318** | **$ 874.627** | **$ 878.128** | **$ 886.692** | **$ 892.230** |

*Source: Statutory reports and FLF analysis*

Table 19: Common size Statement of Financial Position (Consolidated)

| % of Total Assets | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Assets** | | | | | | | | | | |
| Cash and cash equivalents | 13,035% | 12,156% | 12,773% | 10,847% | 14,150% | 16,039% | 15,997% | 16,501% | 18,128% | 18,172% |
| Collateralized agreements: | | | | | | | | | | |
| Securities purchased under agreements to resell and federal funds sold | 15,059% | 17,743% | 14,949% | 15,592% | 13,593% | 12,345% | 11,234% | 10,087% | 8,898% | 8,319% |
| Securities borrowed | 14,586% | 18,054% | 18,779% | 20,622% | 21,461% | 21,854% | 22,604% | 23,270% | 23,793% | 24,389% |
| Receivables: | | | | | | | | | | |
| Brokers, dealers and clearing organizations | 1,969% | 2,615% | 3,584% | 2,955% | 2,098% | 2,047% | 1,936% | 1,921% | 1,861% | 1,684% |
| Customers and counterparties | 6,212% | 8,123% | 7,456% | 5,390% | 5,555% | 5,301% | 5,384% | 5,333% | 4,294% | 4,242% |
| Loans receivable | 1,553% | 1,634% | 3,381% | 5,271% | 5,775% | 7,227% | 8,923% | 10,466% | 11,928% | 13,407% |
| Financial instruments owned, at fair value | 43,366% | 37,204% | 36,484% | 36,395% | 34,406% | 32,124% | 30,736% | 29,128% | 27,714% | 26,305% |
| Other assets | 4,222% | 2,469% | 2,594% | 2,928% | 2,962% | 3,064% | 3,185% | 3,295% | 3,384% | 3,483% |
| **Total assets** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** |
| **Liabilities and shareholders' equity** | | | | | | | | | | |
| Deposits | 7,471% | 7,768% | 9,684% | 11,321% | 14,427% | 15,936% | 17,501% | 18,995% | 20,360% | 21,773% |
| Collateralized financings: | | | | | | | | | | |
| Securities sold under Repo agreements, fair value | 18,305% | 18,078% | 10,307% | 9,992% | 8,349% | 7,919% | 7,303% | 7,006% | 6,672% | 6,367% |
| Securities loaned | 1,467% | 2,056% | 0,651% | 0,420% | 0,875% | 0,886% | 0,970% | 1,051% | 1,125% | 1,202% |
| Other secured financings | 3,411% | 2,722% | 2,665% | 2,874% | 2,502% | 2,450% | 2,352% | 2,247% | 2,129% | 2,021% |
| Payables: | | | | | | | | | | |
| Brokers, dealers and clearing organizations | 0,563% | 0,587% | 0,775% | 0,628% | 0,510% | 0,468% | 0,417% | 0,479% | 0,538% | 0,429% |
| Customers and counterparties | 20,159% | 21,878% | 24,179% | 23,793% | 21,399% | 20,944% | 20,328% | 19,640% | 18,850% | 18,137% |
| Financial instruments sold, but not yet purchased, at fair value | 13,494% | 13,980% | 15,433% | 13,379% | 13,619% | 13,506% | 13,009% | 12,687% | 12,617% | 12,609% |
| Unsecured short-term borrowings, including the current portion of unsecured long-term borrowings | 4,720% | 4,903% | 5,204% | 4,967% | 4,565% | 4,331% | 4,116% | 3,888% | 3,641% | 3,409% |
| Unsecured long-term borrowings | 17,826% | 17,659% | 19,548% | 20,365% | 21,983% | 21,876% | 22,256% | 22,325% | 22,379% | 22,507% |
| Other liabilities and accrued expenses | 4,517% | 1,760% | 1,878% | 2,193% | 1,670% | 1,712% | 1,634% | 1,521% | 1,461% | 1,198% |
| **Total liabilities** | **91,933%** | **91,392%** | **90,326%** | **89,932%** | **89,898%** | **90,027%** | **89,887%** | **89,839%** | **89,773%** | **89,652%** |
| **Shareholders' equity** | | | | | | | | | | |
| Preferred stock, par value $0.01 per share | 0,661% | 0,790% | 1,075% | 1,300% | 1,302% | 1,396% | 1,510% | 1,617% | 1,715% | 1,816% |
| Common stock, par value $0.01 per share | 0,001% | 0,001% | 0,001% | 0,001% | 0,001% | 0,001% | 0,001% | 0,001% | 0,001% | 0,001% |
| Share-based awards | 0,351% | 0,421% | 0,440% | 0,482% | 0,455% | 0,345% | 0,265% | 0,189% | 0,099% | 0,001% |
| Nonvoting common stock, par value $0.01 per share | 0,000% | 0,000% | 0,000% | 0,000% | 0,000% | 0,000% | 0,000% | 0,000% | 0,000% | 0,000% |
| Additional paid-in capital | 5,117% | 5,375% | 5,848% | 5,960% | 6,120% | 6,175% | 6,341% | 6,496% | 6,626% | 6,790% |
| Retained earnings | 6,949% | 7,895% | 9,229% | 9,680% | 10,351% | 10,787% | 11,379% | 11,878% | 12,339% | 12,865% |
| Accumulated other comprehensive loss | (0,021%) | (0,057%) | (0,087%) | (0,083%) | (0,141%) | (0,200%) | (0,226%) | (0,274%) | (0,280%) | (0,300%) |
| Stock held in treasury, at cost, par value $0.01 p/ share | (4,992%) | (5,816%) | (6,832%) | (7,272%) | (7,986%) | (8,531%) | (9,157%) | (9,747%) | (10,273%) | (10,826%) |
| **Total shareholders' equity** | **8,067%** | **8,608%** | **9,674%** | **10,068%** | **10,102%** | **9,973%** | **10,113%** | **10,161%** | **10,227%** | **10,348%** |
| **Total liabilities and shareholders' equity** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** | **100,000%** |

*Source: Statutory reports and FLF analysis*

Table 20: Income Statement (Consolidated)

| in millions, except per share amounts | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Revenues** | | | | | | | | | | |
| Investment banking | $ 4.941 | $ 6.004 | $ 6.464 | $ 7.027 | $ 6.273 | 6.866 | $ 6.646 | $ 5.482 | $ 6.221 | $ 6.784 |
| Investment management | 4.968 | 5.194 | 5.748 | 5.868 | 5.407 | 5.644 | 5.819 | 5.921 | 6.072 | 6.292 |
| Commissions and fees | 3.161 | 3.255 | 3.316 | 3.320 | 3.208 | 3.131 | 3.230 | 3.205 | 3.346 | 3.278 |
| Market making | 11.348 | 9.368 | 8.365 | 9.523 | 9.933 | 8.666 | 8.667 | 9.010 | 9.574 | 10.240 |
| Other principal transactions | 5.865 | 6.993 | 6.588 | 5.018 | 3.200 | 4.911 | 4.412 | 3.362 | 3.341 | 3.334 |
| **Total non-interest revenues** | **30.283** | **30.814** | **30.481** | **30.756** | **28.021** | **29.218** | **28.773** | **26.981** | **28.554** | **29.928** |
| Interest income | 11.381 | 10.060 | 9.604 | 8.452 | 9.691 | 11.932 | 9.481 | 11.147 | 12.601 | 13.747 |
| Interest expense | 7.501 | 6.668 | 5.557 | 5.388 | 7.104 | 9.324 | 6.801 | 7.996 | 9.039 | 9.861 |
| **Net interest income** | **3.880** | **3.392** | **4.047** | **3.064** | **2.587** | **2.608** | **2.680** | **3.151** | **3.562** | **3.886** |
| **Net revenues, including net interest income** | **$ 34.163** | **$ 34.206** | **$ 34.528** | **$ 33.820** | **$ 30.608** | **$ 31.826** | **$ 31.453** | **$ 30.132** | **$ 32.116** | **$ 33.814** |
| **Operating expenses** | | | | | | | | | | |
| Brokerage, clearing, exchange and distribution fees | 2.208 | 2.341 | 2.501 | 2.576 | 2.555 | 2.556 | 2.618 | 2.679 | 2.741 | 2.802 |
| Market development | 509 | 541 | 549 | 557 | 457 | 550 | 553 | 552 | 567 | 570 |
| Communications and technology | 782 | 776 | 779 | 806 | 809 | 894 | 902 | 924 | 946 | 968 |
| Depreciation and amortization | 1.738 | 1.322 | 1.337 | 991 | 998 | 1.044 | 1.065 | 1.090 | 1.115 | 1.140 |
| Occupancy | 875 | 839 | 827 | 772 | 788 | 732 | 730 | 729 | 742 | 734 |
| Professional fees | 867 | 930 | 902 | 963 | 882 | 868 | 815 | 831 | 778 | 794 |
| Other expenses | 3.033 | 3.107 | 2.585 | 5.699 | 2.168 | 2.038 | 2.391 | 2.390 | 2.683 | 2.928 |
| **Total non-compensation expenses** | **10.012** | **9.856** | **9.480** | **12.364** | **8.657** | **8.682** | **9.074** | **9.195** | **9.572** | **9.935** |
| Compensation and benefits | 12.944 | 12.613 | 12.691 | 12.678 | 11.647 | 12.699 | 12.096 | 11.298 | 12.240 | 12.983 |
| **Total operating expenses** | **$ 22.956** | **$ 22.469** | **$ 22.171** | **$ 25.042** | **$ 20.304** | **$ 21.381** | **$ 21.170** | **$ 20.492** | **$ 21.812** | **$ 22.918** |
| **Pre-tax earnings** | **11.207** | **11.737** | **12.357** | **8.778** | **10.304** | **10.445** | **10.283** | **9.639** | **10.304** | **10.896** |
| Provision for taxes | 3.732 | 3.697 | 3.880 | 2.695 | 2.906 | 3.144 | 3.095 | 2.902 | 3.102 | 3.280 |
| **Net earnings** | **$ 7.475** | **$ 8.040** | **$ 8.477** | **$ 6.083** | **$ 7.398** | **$ 7.301** | **$ 7.188** | **$ 6.738** | **$ 7.202** | **$ 7.616** |
| Preferred stock dividends | 183 | 314 | 400 | 515 | 311 | 637 | 697 | 757 | 819 | 881 |
| **Net earnings for common shareholders** | **$ 7.292** | **$ 7.726** | **$ 8.077** | **$ 5.568** | **$ 7.087** | **$ 6.664** | **$ 6.491** | **$ 5.981** | **$ 6.384** | **$ 6.735** |
| **Earnings per common share** | | | | | | | | | | |
| Basic | 14,70 | 16,39 | 17,60 | 12,40 | 16,58 | 16,09 | 16,15 | 15,34 | 16,89 | 18,38 |
| Diluted | 14,13 | 15,46 | 17,07 | 12,14 | 16,29 | 15,81 | 15,89 | 15,10 | 16,63 | 18,10 |
| **Average common shares** | | | | | | | | | | |
| Basic | 496,2 | 471,3 | 458,9 | 448,9 | 427,4 | 414,2 | 401,8 | 389,8 | 378,0 | 366,5 |
| Diluted | 516,1 | 499,6 | 473,2 | 458,6 | 435,1 | 421,5 | 408,6 | 396,2 | 383,9 | 372,2 |

*Source: Statutory reports and FLF analysis*

Table 21: Common size Income Statement (Consolidated)

| % of Total Revenues | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Revenues** | | | | | | | | | | |
| Investment banking | 14,46% | 17,55% | 18,72% | 20,78% | 20,49% | 21,57% | 21,13% | 18,19% | 19,37% | 20,06% |
| Investment management | 14,54% | 15,18% | 16,65% | 17,35% | 17,67% | 17,73% | 18,50% | 19,65% | 18,91% | 18,61% |
| Commissions and fees | 9,25% | 9,52% | 9,60% | 9,82% | 10,48% | 9,84% | 10,27% | 10,64% | 10,42% | 9,69% |
| Market making | 33,22% | 27,39% | 24,23% | 28,16% | 32,45% | 27,23% | 27,56% | 29,90% | 29,81% | 30,28% |
| Other principal transactions | 17,17% | 20,44% | 19,08% | 14,84% | 10,45% | 15,43% | 14,03% | 11,16% | 10,40% | 9,86% |
| **Total non-interest revenues** | **88,64%** | **90,08%** | **88,28%** | **90,94%** | **91,55%** | **91,81%** | **91,48%** | **89,54%** | **88,91%** | **88,51%** |
| **Net interest income** | **11,36%** | **9,92%** | **11,72%** | **9,06%** | **8,45%** | **8,19%** | **8,52%** | **10,46%** | **11,09%** | **11,49%** |
| **Net revenues, including net interest income** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** |
| **Operating expenses** | | | | | | | | | | |
| Brokerage, clearing, exchange and distribution fees | 6,46% | 6,84% | 7,24% | 7,62% | 8,35% | 8,03% | 8,32% | 8,89% | 8,53% | 8,29% |
| Market development | 1,49% | 1,58% | 1,59% | 1,65% | 1,49% | 1,73% | 1,76% | 1,83% | 1,77% | 1,69% |
| Communications and technology | 2,29% | 2,27% | 2,26% | 2,38% | 2,64% | 2,81% | 2,87% | 3,07% | 2,95% | 2,86% |
| Depreciation and amortization | 5,09% | 3,86% | 3,87% | 2,93% | 3,26% | 3,28% | 3,39% | 3,62% | 3,47% | 3,37% |
| Occupancy | 2,56% | 2,45% | 2,40% | 2,28% | 2,57% | 2,30% | 2,32% | 2,42% | 2,31% | 2,17% |
| Professional fees | 2,54% | 2,72% | 2,61% | 2,85% | 2,88% | 2,73% | 2,59% | 2,76% | 2,42% | 2,35% |
| Other expenses | 8,88% | 9,08% | 7,49% | 16,85% | 7,08% | 6,40% | 7,60% | 7,93% | 8,35% | 8,66% |
| **Total non-compensation expenses** | **29,31%** | **28,81%** | **27,46%** | **36,56%** | **28,28%** | **27,28%** | **28,85%** | **30,51%** | **29,80%** | **29,38%** |
| Compensation and benefits | 37,89% | 36,87% | 36,76% | 37,49% | 38,05% | 39,90% | 38,46% | 37,49% | 38,11% | 38,39% |
| **Total operating expenses** | **67,20%** | **65,69%** | **64,21%** | **74,04%** | **66,34%** | **67,18%** | **67,31%** | **68,01%** | **67,92%** | **67,78%** |
| Pre-tax earnings | 32,80% | 34,31% | 35,79% | 25,96% | 33,66% | 32,82% | 32,69% | 31,99% | 32,08% | 32,22% |
| Provision for taxes | 10,92% | 10,81% | 11,24% | 7,97% | 9,49% | 9,88% | 9,84% | 9,63% | 9,66% | 9,70% |
| **Net earnings** | **21,88%** | **23,50%** | **24,55%** | **17,99%** | **24,17%** | **22,94%** | **22,85%** | **22,36%** | **22,43%** | **22,52%** |
| Preferred stock dividends | 0,54% | 0,92% | 1,16% | 1,52% | 1,02% | 2,00% | 2,21% | 2,51% | 2,55% | 2,61% |
| **Net earnings applicable to common shareholders** | 21,34% | 22,59% | 23,39% | 16,46% | 23,15% | 20,94% | 20,64% | 19,85% | 19,88% | 19,92% |

*Source: Statutory reports and FLF analysis*

Table 21: Cash Flow Statement (Consolidated)

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cash flows from operating activities** | | | | | | | | | | |
| **Net earnings** | **$ 7.475** | **$ 8.040** | **$ 8.477** | **$ 6.083** | **$ 7.398** | **$ 7.301** | **$ 7.188** | **$ 6.738** | **$ 7.202** | **$ 7.616** |
| Adjustments to reconcile net earnings to net cash provided by/(used for) operating activities: | | | | | | | | | | |
| Depreciation and amortization | 1.738 | 1.322 | 1.337 | 991 | 998 | 1.044 | 1.065 | 1.090 | 1.115 | 1.140 |
| Deferred income taxes | (356) | 29 | 495 | 425 | 551 | 498 | 490 | 459 | 491 | 519 |
| Share-based compensation | 1.319 | 2.015 | 2.085 | 2.272 | 2.111 | 2.425 | 2.405 | 2.334 | 2.625 | 2.885 |
| Other, net | (494) | (211) | (289) | (34) | 3 | (108) | 40 | 110 | 180 | 250 |
| Changes in operating assets and liabilities: | | | | | | | | | | |
| Receivables and payables (excl. loans receivable), net | (20.499) | (3.682) | 12.328 | 19.132 | (15.813) | 327 | (5.540) | (4.439) | 4.359 | (4.564) |
| Collateralized transactions (excluding other secured financings), net | 76.558 | (51.669) | (52.104) | (14.825) | 78 | 160 | (1.567) | 1.429 | 1.431 | (3.568) |
| Financial instruments owned, at fair value | (48.783) | 51.079 | 27.547 | 16.078 | 15.253 | 14.155 | 14.162 | 11.593 | 10.024 | 8.955 |
| Financial instruments sold, but not yet purchased, at fair value | (18.867) | 933 | 4.642 | (16.835) | 1.960 | 944 | (4.306) | (2.374) | 470 | 626 |
| Other, net | 14.788 | (3.313) | (12.141) | (5.417) | (6.969) | (8.098) | (6.288) | (5.477) | (6.666) | (7.855) |
| **Net cash provided by/(used for) operating activities** | **$ 12.879** | **$ 4.543** | **$ (7.932)** | **$ 7.870** | **$ 5.570** | **$ 18.648** | **$ 7.649** | **$ 11.463** | **$ 21.231** | **$ 6.005** |
| **Cash flows from investing activities** | | | | | | | | | | |
| Purchase of property, leasehold improvements and equipment | (961) | (706) | (678) | (1.833) | (2.876) | (3.042) | (2.946) | (3.015) | (3.073) | (3.128) |
| Proceeds from sales of property, leasehold improvements and equipment | 49 | 62 | 30 | 228 | 381 | 302 | 369 | 415 | 461 | 508 |
| Net cash acquired in/(used for) business acquisitions | (593) | (2.274) | (1.732) | (1.808) | 14.922 | (2.172) | (2.272) | (2.406) | (2.541) | (2.675) |
| Purchase of Investments | - | - | - | - | - | (1.456) | (1.523) | (1.613) | (1.703) | (1.793) |
| Proceeds from sales and paydowns of investments | 1.195 | 2.503 | 1.514 | 1.019 | 1.512 | 1.654 | 1.216 | 1.136 | 1.056 | 975 |
| Loans receivable, net | (2.741) | (8.392) | (14.043) | (16.180) | (4.669) | (10.672) | (10.543) | (10.944) | (11.345) | (11.747) |
| Other, net | (683) | 79 | - | - | - | - | - | - | - | - |
| **Net cash provided by/(used for) investing activities** | **$ (3.734)** | **$ (8.728)** | **$ (14.909)** | **$ (18.574)** | **$ 9.270** | **$ (15.386)** | **$ (15.699)** | **$ (16.427)** | **$ (17.145)** | **$ (17.860)** |
| **Cash flows from financing activities** | | | | | | | | | | |
| Short-term borrowings, net | (412) | (5.936) | 822 | (1.236) | (2.314) | (937) | (1.464) | (1.673) | (1.882) | (2.091) |
| Proceeds from issuance long-term borrowings | 32.421 | 37.455 | 46.757 | 54.944 | 54.949 | 62.674 | 67.350 | 74.962 | 82.574 | 90.185 |
| Repayment of long-term financings | (48.011) | (34.103) | (35.774) | (36.022) | (43.932) | (54.807) | (61.581) | (68.541) | (75.501) | (82.460) |
| Deposits, net | 24.015 | 683 | 12.201 | 14.639 | 10.058 | 12.384 | 9.840 | 11.569 | 13.078 | 14.268 |
| Common stock repurchased | (4.640) | (6.175) | (5.469) | (4.135) | (6.078) | (5.760) | (5.534) | (5.534) | (5.534) | (5.534) |
| Dividends and dividend equivalents paid on common stock, preferred stock and share-based awards | (1.086) | (1.302) | (1.454) | (1.681) | (1.706) | (1.752) | (1.917) | (1.897) | (2.040) | (2.175) |
| Proceeds from issuance of preferred stock, net of issuance costs | 3.087 | 991 | 1.980 | 1.993 | 1.303 | 991 | 992 | 993 | 993 | 993 |
| Proceeds from issuance of common stock, including exercise of share-based awards | 317 | 65 | 123 | 259 | 6 | 14 | 54 | 63 | 68 | 63 |
| Other, net | 1.825 | 971 | (187) | 357 | 1.146 | 2.449 | 2.565 | 2.794 | 3.024 | 3.253 |
| **Net cash provided by financing activities** | **$ 7.516** | **$ (7.351)** | **$ 18.999** | **$ 29.118** | **$ 13.432** | **$ 15.255** | **$ 7.740** | **$ 9.943** | **$ 11.756** | **$ 13.248** |
| **Net increase/(decrease) in cash and cash equivalents** | 16.661 | (11.536) | (3.842) | 18.414 | 28.272 | 18.518 | (310) | 4.979 | 15.842 | 1.393 |
| Post-presentation revaluation | - | 17.734 | - | - | - | - | - | - | - | - |
| **Cash and cash equivalents, beginning balance** | $ 56.008 | $ 72.669 | $ 78.867 | $ 75.025 | $ 93.439 | $ 121.711 | $ 140.229 | $ 139.918 | $ 144.897 | $ 160.739 |
| **Cash and cash equivalents, ending balance** | $ 72.669 | $ 78.867 | $ 75.025 | $ 93.439 | $ 121.711 | $ 140.229 | $ 139.918 | $ 144.897 | $ 160.739 | $ 162.132 |

*Source: Statutory reports and FLF analysis*

Table 23: Statement of Retained Earnings (Consolidated)

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Preferred stock** | | | | | | | | | | |
| Beginning balance | 3.100 | 6.200 | 7.200 | 9.200 | 11.200 | 11.203 | 12.203 | 13.203 | 14.203 | 15.203 |
| Issued | 3.100 | 1.000 | 2.000 | 2.000 | 1.325 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Redeemed | - | - | - | - | (1.322) | - | - | - | - | - |
| Ending balance | 6.200 | 7.200 | 9.200 | 11.200 | 11.203 | 12.203 | 13.203 | 14.203 | 15.203 | 16.203 |
| **Common stock** | | | | | | | | | | |
| Beginning balance | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| Issued | - | - | 1 | - | - | - | - | - | - | - |
| Ending balance | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| **Share-based awards** | | | | | | | | | | |
| Beginning balance | 5.681 | 3.298 | 3.839 | 3.766 | 4.151 | 3.914 | 3.014 | 2.322 | 1.655 | 881 |
| Operations, net | (2.383) | 541 | (73) | 385 | (237) | (900) | (692) | (666) | (774) | (871) |
| Ending balance | 3.298 | 3.839 | 3.766 | 4.151 | 3.914 | 3.014 | 2.322 | 1.655 | 881 | 11 |
| **Additional paid-in capital** | | | | | | | | | | |
| Beginning balance | 45.553 | 48.030 | 48.998 | 50.049 | 51.340 | 52.638 | 53.987 | 55.456 | 57.046 | 58.756 |
| Operations, net | 2.477 | 968 | 1.051 | 1.291 | 1.298 | 1.349 | 1.469 | 1.590 | 1.710 | 1.830 |
| Ending balance | 48.030 | 48.998 | 50.049 | 51.340 | 52.638 | 53.987 | 55.456 | 57.046 | 58.756 | 60.586 |
| **Retained earnings** | | | | | | | | | | |
| Beginning balance, as previously reported | 58.834 | 65.223 | 71.961 | 78.984 | 83.386 | 89.039 | 94.316 | 99.527 | 104.308 | 109.409 |
| Reclassification of cumulative debt valuation adjustment, net of tax, to accumulated other comprehensive loss | - | - | - | - | (305) | - | - | - | - | - |
| Beginning balance, adjusted | 58.834 | 65.223 | 71.961 | 78.984 | 83.081 | 89.039 | 94.316 | 99.527 | 104.308 | 109.409 |
| Net earnings | 7.475 | 8.040 | 8.477 | 6.083 | 7.398 | 7.301 | 7.188 | 6.738 | 7.202 | 7.616 |
| Dividends and dividend equivalents declared on common stock and share-based awards | (903) | (988) | (1.054) | (1.166) | (1.129) | (1.387) | (1.280) | (1.200) | (1.283) | (1.356) |
| Dividends declared on preferred stock | (183) | (314) | (400) | (515) | (311) | (637) | (697) | (757) | (819) | (881) |
| Ending balance | 65.223 | 71.961 | 78.984 | 83.386 | 89.039 | 94.316 | 99.527 | 104.308 | 109.409 | 114.787 |
| **Accumulated other comprehensive loss** | | | | | | | | | | |
| Beginning balance, adjusted | (516) | (193) | (524) | (743) | (413) | (1.216) | (1.747) | (1.980) | (2.404) | (2.483) |
| Other comprehensive income/(loss) | 323 | (331) | (219) | 25 | (803) | (531) | (233) | (424) | (79) | (191) |
| Ending balance | (193) | (524) | (743) | (718) | (1.216) | (1.747) | (1.980) | (2.404) | (2.483) | (2.674) |
| **Stock held in treasury, at cost** | | | | | | | | | | |
| Beginning balance | (42.281) | (46.850) | (53.015) | (58.468) | (62.640) | (68.694) | (74.590) | (80.090) | (85.590) | (91.092) |
| Repurchased | (4.637) | (6.175) | (5.469) | (4.195) | (6.069) | (5.932) | (5.534) | (5.534) | (5.534) | (5.534) |
| Other, net | 68 | 10 | 16 | 23 | 15 | 36 | 34 | 33 | 32 | 30 |
| Ending balance | (46.850) | (53.015) | (58.468) | (62.640) | (68.694) | (74.590) | (80.090) | (85.590) | (91.092) | (96.595) |
| **Total shareholders' equity** | **75.716** | **78.467** | **82.797** | **86.728** | **86.893** | **87.192** | **88.447** | **89.227** | **90.683** | **92.326** |

*Source: Statutory reports and FLF analysis*

Table 24: Total Assets under Supervision

| $ in billions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Provenance** | | | | | | | | | | |
| Assets Under Management | $ 854 | $ 919 | $ 1.027 | $ 1.078 | $ 1.177 | $ 1.265 | $ 1.360 | $ 1.436 | $ 1.533 | $ 1.612 |
| Other Client Assets | 111 | 123 | 151 | 174 | 202 | 232 | 265 | 297 | 336 | 374 |
| **Total AUS** | **$ 965** | **$ 1.042** | **$ 1.178** | **$ 1.252** | **$ 1.379** | **$ 1.497** | **$ 1.625** | **$ 1.733** | **$ 1.869** | **$ 1.985** |
| **Asset Class** | | | | | | | | | | |
| Alternative investments | $ 151 | $ 142 | $ 143 | $ 148 | $ 154 | $ 158 | $ 162 | $ 166 | $ 170 | $ 174 |
| Equity | 153 | 208 | 236 | 252 | 266 | 306 | 333 | 359 | 386 | 412 |
| Fixed income | 411 | 446 | 516 | 546 | 601 | 640 | 700 | 736 | 796 | 832 |
| **Total long-term AUS** | **$ 715** | **$ 796** | **$ 895** | **$ 946** | **$ 1.021** | **$ 1.104** | **$ 1.195** | **$ 1.261** | **$ 1.352** | **$ 1.418** |
| Liquidity products | 250 | 246 | 283 | 306 | 358 | 393 | 430 | 472 | 517 | 567 |
| **Total AUS** | **$ 965** | **$ 1.042** | **$ 1.178** | **$ 1.252** | **$ 1.379** | **$ 1.497** | **$ 1.625** | **$ 1.733** | **$ 1.869** | **$ 1.985** |
| **Distribution Channel** | | | | | | | | | | |
| Institutional | $ 343 | $ 363 | $ 412 | $ 471 | $ 511 | $ 539 | $ 585 | $ 624 | $ 673 | $ 715 |
| High-net-worth individuals | 294 | 330 | 363 | 369 | 413 | 456 | 495 | 528 | 570 | 605 |
| Third-party distributed | 328 | 349 | 403 | 412 | 455 | 502 | 545 | 581 | 627 | 665 |
| **Total AUS** | **$ 965** | **$ 1.042** | **$ 1.178** | **$ 1.252** | **$ 1.379** | **$ 1.497** | **$ 1.625** | **$ 1.733** | **$ 1.869** | **$ 1.985** |

*Source: Statutory reports and FLF analysis*

Table 25: IM segment results

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| Management + other fees | $ 4.105 | $ 4.386 | $ 4.800 | $ 4.887 | $ 4.798 | $ 5.006 | $ 5.229 | $ 5.394 | $ 5.545 | $ 5.757 |
| Incentive fees | 701 | 662 | 776 | 780 | 421 | 404 | 331 | 246 | 252 | 261 |
| Transaction revenues | 416 | 415 | 466 | 539 | 569 | 650 | 715 | 773 | 795 | 825 |
| **Total net revenues** | **$ 5.222** | **$ 5.463** | **$ 6.042** | **$ 6.206** | **$ 5.788** | **$ 6.060** | **$ 6.275** | **$ 6.413** | **$ 6.591** | **$ 6.843** |
| Operating expenses | 4.296 | 4.357 | 4.647 | 4.841 | 4.654 | 4.847 | 5.053 | 5.167 | 5.331 | 5.523 |
| **Pre-tax earnings** | **$ 926** | **$ 1.106** | **$ 1.395** | **$ 1.365** | **$ 1.134** | **$ 1.213** | **$ 1.222** | **$ 1.246** | **$ 1.260** | **$ 1.320** |

*Source: Statutory reports and FLF analysis*

Table 26: IB segment results

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Financial Advisory** | **$ 1.975** | **$ 1.978** | **$ 2.474** | **$ 3.470** | **$ 2.932** | **$ 3.010** | **$ 2.895** | **$ 2.362** | **$ 2.641** | **$ 2.975** |
| Equity underwriting | 987 | 1.659 | 1.750 | 1.546 | 891 | 1.142 | 1.039 | 539 | 596 | 672 |
| Debt underwriting | 1.964 | 2.367 | 2.240 | 2.011 | 2.450 | 2.714 | 2.712 | 2.581 | 2.984 | 3.137 |
| **Total Underwriting** | **2.951** | **4.026** | **3.990** | **3.557** | **3.341** | **3.856** | **3.751** | **3.120** | **3.580** | **3.809** |
| **Total net revenues** | **$ 4.926** | **$ 6.004** | **$ 6.464** | **$ 7.027** | **$ 6.273** | **$ 6.866** | **$ 6.646** | **$ 5482** | **$ 6.221** | **$ 6.784** |
| Operating expenses | 3.333 | 3.479 | 3.688 | 3.713 | 3.437 | 3.918 | 3.847 | 3.174 | 3.601 | 3.928 |
| **Pre-tax earnings** | **$ 1.593** | **$ 2.525** | **$ 2.776** | **$ 3.314** | **$ 2.836** | **$ 2.948** | **$ 2.798** | **$ 2.308** | **$ 2.619** | **$ 2.857** |

*Source: Statutory reports and FLF analysis*

Table 27: ICS segment results (decomposed)

| | $ in millions | FICC Client Execution | Total Equities | Total Institutional Client Services | | $ in millions | FICC Client Execution | Total Equities | Total Institutional Client Services |
|---|---|---|---|---|---|---|---|---|---|
| FY12A | Market making | $ 7.480 | $ 3.868 | $ 11.348 | FY17F | Market making | $ 5.118 | $ 3.548 | $ 8.666 |
| | Commissions and fees | - | 3.053 | 3.053 | | Commissions and fees | - | 3.004 | 3.004 |
| | Net interest income | 2.434 | 1.289 | 3.723 | | Net interest income | 570 | 580 | 1.150 |
| | **Total net revenues** | **$ 9.914** | **$ 8.210** | **$ 18.124** | | **Total net revenues** | **$ 5.688** | **$ 7.132** | **$12.820** |
| FY13A | Market making | 6.393 | 2.975 | 9.368 | FY18F | Market making | 5.112 | 3.555 | 8.667 |
| | Commissions and fees | - | 3.103 | 3.103 | | Commissions and fees | - | 3.102 | 3.102 |
| | Net interest income | 2.258 | 992 | 3.250 | | Net interest income | 498 | 441 | 939 |
| | **Total net revenues** | **$ 8.651** | **$ 7.070** | **$ 15.721** | | **Total net revenues** | **$ 5.610** | **$ 7.098** | **$12.708** |
| FY14A | Market making | 5.623 | 2.742 | 8.365 | FY19F | Market making | 5.748 | 3.262 | 9.010 |
| | Commissions and fees | - | 3.153 | 3.153 | | Commissions and fees | - | 3.078 | 3.078 |
| | Net interest income | 2.838 | 841 | 3.679 | | Net interest income | 597 | 528 | 1.125 |
| | **Total net revenues** | **$8.461** | **$ 6.736** | **$ 15.197** | | **Total net revenues** | **$ 6.345** | **$ 6.868** | **$ 13.213** |
| FY15A | Market making | 5.893 | 3.630 | 9.523 | FY20F | Market making | 5.847 | 3.727 | 9.574 |
| | Commissions and fees | - | 3.153 | 3.153 | | Commissions and fees | - | 3.214 | 3.214 |
| | Net interest income | 1.429 | 1.043 | 2.472 | | Net interest income | 666 | 590 | 1.256 |
| | **Total net revenues** | **$ 7.322** | **$ 7.829** | **$ 15.151** | | **Total net revenues** | **$ 6.513** | **$ 7.531** | **$ 14.044** |
| FY16A | Market making | 6.803 | 3.130 | 9.933 | FY21F | Market making | 6.382 | 3.858 | 10.240 |
| | Commissions and fees | - | 3.078 | 3.078 | | Commissions and fees | - | 3.148 | 3.148 |
| | Net interest income | 753 | 703 | 1.456 | | Net interest income | 687 | 609 | 1.296 |
| | **Total net revenues** | **$ 7.556** | **$ 6.911** | **$14.467** | | **Total net revenues** | **$ 7.069** | **$ 7.615** | **$ 14.684** |

*Source: Statutory reports and FLF analysis*

Table 28: ICS segment results

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **FICC Client Execution** | **$ 9.914** | **$ 8.651** | **$ 8.461** | **$ 7.322** | **$ 7.556** | **$ 5.688** | **$ 5.610** | **$ 6.345** | **$ 6.513** | **$ 7.069** |
| Equities client execution | 3.171 | 2.594 | 2.079 | 3.028 | 2.194 | 2.478 | 2.347 | 2.186 | 2.569 | 2.784 |
| Commissions and fees | 3.053 | 3.103 | 3.153 | 3.156 | 3.078 | 3.004 | 3.102 | 3.078 | 3.214 | 3.148 |
| Securities services | 1.986 | 1.373 | 1.504 | 1.645 | 1.639 | 1.650 | 1.649 | 1.604 | 1.748 | 1.683 |
| **Total Equities** | **8.210** | **7.070** | **6.736** | **7.829** | **6.911** | **7.132** | **7.098** | **6.868** | **7.531** | **7.615** |
| **Total net revenues** | **$ 18.124** | **$ 15.721** | **$ 15.197** | **$ 15.151** | **$ 14.467** | **$ 12.820** | **$ 12.708** | **$ 13.213** | **$ 14.044** | **$ 14.684** |
| Operating expenses | 12.480 | 11.782 | 10.880 | 13.938 | 9.713 | 9.590 | 9.506 | 9.884 | 10.505 | 10.984 |
| **Pre-tax earnings** | **$ 5.644** | **$ 3.939** | **$ 4.317** | **$ 1.213** | **$ 4.754** | **$ 3.230** | **$ 3.202** | **$ 3.329** | **$ 3.539** | **$ 3.700** |

*Source: Statutory reports and FLF analysis*

Table 29: I&L segment results

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| Equity securities | $ 3.922 | $ 4.962 | $ 4.579 | $ 3.781 | $ 2.573 | $ 3.956 | $ 3.867 | $ 3.290 | $ 3.415 | $ 3.596 |
| Debt securities and loans | 1.969 | 2.056 | 2.246 | 1.655 | 1.507 | 2.124 | 1.957 | 1.733 | 1.845 | 1.907 |
| **Total net revenues** | **$ 5.891** | **$ 7.018** | **$ 6.825** | **$ 5.436** | **$ 4.080** | **$ 6.080** | **$ 5.824** | **$ 5.023** | **$ 5.260** | **$ 5.503** |
| Operating expenses | 2.668 | 2.686 | 2.819 | 2.402 | 2.386 | 3.026 | 2.763 | 2.267 | 2.374 | 2.484 |
| **Pre-tax earnings** | **$ 3.223** | **$ 4.332** | **$ 4.006** | **$ 3.034** | **$ 1.694** | **$ 3.054** | **$ 3.061** | **$ 2.756** | **$ 2.886** | **$ 3.019** |

*Source: Statutory reports and FLF analysis*

Table 30: Total Net Interest Income

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| Investment Banking | $ (15) | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Institutional Client Services | 3.723 | 3.250 | 3.679 | 2.472 | 1.456 | 1.150 | 939 | 1.125 | 1.256 | 1.296 |
| Investing & Lending | 26 | 25 | 237 | 418 | 880 | 1.184 | 1.440 | 1.702 | 1.964 | 2.227 |
| Investment Management | 146 | 117 | 131 | 174 | 251 | 274 | 301 | 324 | 342 | 363 |
| Total net Interest Income | $ 3.880 | $ 3.392 | $ 4.047 | $ 3.064 | $ 2.587 | $ 2.608 | $ 2.680 | $ 3.151 | $ 3.562 | $ 3.886 |

*Source: Statutory reports and FLF analysis*

Table 31: Total results, by segment

| $ in millions | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Investment Banking** | | | | | | | | | | |
| Net revenues | $ 4.926 | $ 6.004 | $ 6.464 | $ 7.027 | $ 6.273 | $ 6.866 | $ 6.646 | $ 5.482 | $ 6.221 | $ 6.784 |
| Operating expenses | 3.333 | 3.479 | 3.688 | 3.713 | 3.437 | 3.918 | 3.847 | 3.174 | 3.601 | 3.928 |
| Pre-tax earnings | $ 1.593 | $ 2.525 | $ 2.776 | $ 3.314 | $ 2.836 | 2.948 | 2.798 | 2.308 | 2.619 | 2.857 |
| **Institutional Client Services** | | | | | | | | | | |
| Net revenues | $ 18.124 | $ 15.721 | $ 15.197 | $ 15.151 | $ 14.467 | $ 12.820 | $ 12.708 | $ 13.213 | $ 14.044 | $ 14.684 |
| Operating expenses | 12.480 | 11.782 | 10.880 | 13.938 | 9.713 | 9.590 | 9.506 | 9.884 | 10.505 | 10.984 |
| Pre-tax earnings | $ 5.644 | $ 3.939 | $ 4.317 | $ 1.213 | $ 4.754 | $ 3.230 | $ 3.202 | $ 3.329 | $ 3.539 | $ 3.700 |
| **Investing & Lending** | | | | | | | | | | |
| Net revenues | $ 5.891 | $ 7.018 | $ 6.825 | $ 5.436 | $ 4.080 | $ 6.080 | $ 5.824 | $ 5.023 | $ 5.260 | $ 5.503 |
| Operating expenses | 2.668 | 2.686 | 2.819 | 2.402 | 2.386 | 3.026 | 2.763 | 2.267 | 2.374 | 2.484 |
| Pre-tax earnings | $ 3.223 | $ 4.332 | $ 4.006 | $ 3.034 | $ 1.694 | $ 3.054 | $ 3.061 | $ 2.756 | $ 2.886 | $ 3.019 |
| **Investment Management** | | | | | | | | | | |
| Net revenues | $ 5.222 | $ 5.463 | $ 6.042 | $ 6.206 | $ 5.788 | $ 6.060 | $ 6.275 | $ 6.413 | $ 6.591 | $ 6.843 |
| Operating expenses | 4.296 | 4.357 | 4.647 | 4.841 | 4.654 | 4.847 | 5.053 | 5.167 | 5.331 | 5.523 |
| Pre-tax earnings | $ 926 | $ 1.106 | $ 1.395 | $ 1.365 | $ 1.134 | $ 1.213 | $ 1.222 | $ 1.246 | $ 1.260 | $ 1.320 |
| **Total net revenues** | **$ 34.163** | **$ 34.206** | **$ 34.528** | **$ 33.820** | **$ 30.608** | **$ 31.826** | **$ 31.453** | **$ 30.132** | **$ 32.116** | **$ 33.814** |
| **Total operating expenses** | **22.777** | **22.304** | **22.171** | **25.042** | **20.304** | **21.381** | **21.170** | **20.492** | **21.812** | **22.918** |
| **Total pre-tax earnings** | **$ 11.386** | **$ 11.902** | **$ 12.357** | **$ 8.778** | **$ 10.304** | **$ 10.445** | **$ 10.283** | **$ 9.639** | **$ 10.304** | **$ 10.896** |

*Source: Statutory reports and FLF analysis*

Table 32: GS's DuPont Identity

| | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| Net Income | 7.475 | 8.040 | 8.477 | 6.083 | 7.398 | 7.301 | 7.188 | 6.738 | 7.202 | 7.616 |
| Revenue | 34.163 | 34.206 | 34.528 | 33.820 | 30.608 | 31.826 | 31.453 | 30.132 | 32.116 | 33.814 |
| **Net Profit Margin** | **21,88%** | **23,50%** | **24,55%** | **17,99%** | **24,17%** | **22,94%** | **22,85%** | **22,36%** | **22,43%** | **22,52%** |
| Total Revenue | 34.163 | 34.206 | 34.528 | 33.820 | 30.608 | 31.826 | 31.453 | 30.132 | 32.116 | 33.814 |
| Average TA | 930.890 | 925.031 | 883.675 | 858.619 | 860.780 | 867.241 | 874.472 | 876.378 | 882.410 | 889.461 |
| **Asset Turnover** | **0,04 x** | **0,04 x** | **0,04 x** | **0,04 x** | **0,04 x** | **0,04 x** | **0,04 x** | **0,03 x** | **0,04 x** | **0,04 x** |
| Average TA | 930.890 | 925.031 | 883.675 | 858.619 | 860.780 | 867.241 | 874.472 | 876.378 | 882.410 | 889.461 |
| Average TSE | 73.048 | 77.092 | 80.632 | 84.763 | 86.811 | 87.042 | 87.819 | 88.837 | 89.955 | 91.505 |
| **Equity Multiplier** | **12,74 x** | **12,00 x** | **10,96 x** | **10,13 x** | **9,92 x** | **9,96 x** | **9,96 x** | **9,87 x** | **9,81 x** | **9,72 x** |
| ROE | 10,23% | 10,43% | 10,51% | 7,18% | 8,52% | 8,39% | 8,18% | 7,58% | 8,01% | 8,32% |
| 3-Step ROE | 10,23% | 10,43% | 10,51% | 7,18% | 8,52% | 8,39% | 8,18% | 7,58% | 8,01% | 8,32% |
| ROCE | 10,69% | 11,42% | 11,70% | 8,16% | 9,78% | 9,69% | 9,57% | 8,97% | 9,57% | 10,05% |

*Source: Statutory Reports and FLF analysis*

Table 33: Capital Ratios and other financial ratios

| | FY12A | FY13A | FY14A | FY15A | FY16A | FY17F | FY18F | FY19F | FY20F | FY21F |
|---|---|---|---|---|---|---|---|---|---|---|
| **Capital Ratios** | | | | | | | | | | |
| **CET1 ratio** | | | | | | | | | | |
| Standardized | 14,5% | 14,6% | 10,9% | 13,6% | 14,5% | 13,9% | 13,8% | 13,5% | 13,4% | 13,4% |
| Basel III Advanced | 9,8% | 9,8% | 11,3% | 12,4% | 13,1% | 13,3% | 12,8% | 12,6% | 12,5% | 12,5% |
| **Tier 1 capital ratio** | | | | | | | | | | |
| Standardized | 16,7% | 16,7% | 12,2% | 15,6% | 16,6% | 16,1% | 16,2% | 16,1% | 16,1% | 16,3% |
| Basel III Advanced | 11,3% | 12,2% | 12,7% | 14,1% | 15,0% | 15,4% | 15,0% | 14,9% | 15,0% | 15,1% |
| **Total capital ratio** | | | | | | | | | | |
| Standardized | 20,1% | 19,9% | 14,4% | 18,7% | 19,8% | 19,3% | 19,5% | 19,3% | 19,3% | 19,5% |
| Basel III Advanced | 13,5% | 14,5% | 15,0% | 16,9% | 17,8% | 18,3% | 17,7% | 17,7% | 17,8% | 17,9% |
| **Tier 1 leverage ratio** | 7,3% | 8,1% | 8,4% | 9,3% | 9,4% | 9,5% | 9,6% | 9,7% | 9,8% | 9,9% |
| | | | | | | | | | | |
| Loan Growth | 25,82% | 2,20% | 94,28% | 56,91% | 9,39% | 27,20% | 23,52% | 17,76% | 15,08% | 13,11% |
| Deposit Growth | 52,08% | 0,97% | 17,05% | 17,66% | 27,26% | 12,28% | 9,86% | 8,97% | 8,23% | 7,61% |
| Loan/Deposit Ratio | 20,78% | 21,04% | 34,92% | 46,56% | 40,02% | 45,35% | 50,99% | 55,10% | 58,59% | 61,58% |
| Loan to Assets Ratio | 1,55% | 1,60% | 3,38% | 5,27% | 5,78% | 7,23% | 8,92% | 10,47% | 11,93% | 13,41% |
| Net Interest Margin | 0,47% | 0,41% | 0,51% | 0,40% | 0,33% | 0,33% | 0,34% | 0,40% | 0,45% | 0,48% |
| | | | | | | | | | | |
| BVPS | 140,1 | 151,21 | 160,38 | 168,25 | 177,09 | 181,05 | 187,25 | 192,47 | 199,69 | 207,73 |
| ROA | 0,80% | 0,86% | 0,96% | 0,71% | 0,86% | 0,84% | 0,82% | 0,77% | 0,82% | 0,86% |
| Efficiency Ratio | 55,10% | 54,97% | 55,31% | 63,87% | 53,84% | 51,96% | 55,34% | 53,75% | 53,00% | 52,47% |
| P/E | 8,25 | 10,2 | 10,75 | 10,26 | 14,18 | - | - | - | - | - |
| Price to Book Value | 0,85 | 1,16 | 1,13 | 1 | 1,24 | - | - | - | - | - |

*Source: Statutory Reports, Bloomberg and FLF analysis*

Table 34: CET1 decomposition – 6m17A

| | Transitional basis | Fully phased-in basis |
|---|---|---|
| Common shareholders' equity | $ 75.472 | $ 75.472 |
| Deductions[3] | (2.943) | (3.012) |
| Other adjustments | (361) | (497) |
| CET1 | 72.168 | 71.963 |
| **Standardized** | | |
| RWAs | $ 521.043 | $ 534.519 |
| Credit RWAs | 436.779 | 450.255 |
| Market RWAs | 84.264 | 84.264 |
| CET1 | 13,9% | 13,5% |
| **Basel III Advanced** | | |
| RWAs | $ 575.762 | $ 589.551 |
| Credit RWAs | 376.848 | 390.637 |
| Market RWAs | 83.664 | 83.664 |
| Operational RWAs | 115.250 | 115.250 |
| CET1 ratio | 12,5% | 12,5% |

*Source: Statutory Reports*

[3] Deductions for goodwill and identifiable intangible assets, net of deferred tax liabilities

Table 35: GS Excess return valuation

| | FY17 | FY18 | FY19 | FY20 | FY21 | Terminal Value |
|---|---|---|---|---|---|---|
| Net Income | $ 6.664 | $ 6.491 | $ 5.981 | $ 6.384 | $ 6.735 | $ 6.856 |
| - Equity Cost | 5.764 | 5.711 | 5.730 | 5.713 | 5.748 | 5.797 |
| Excess Equity Return | 900 | 781 | 251 | 670 | 987 | 1.059 |
| Terminal Value of Excess Equity Return | | | | | 18.206 | |
| Present Value | 900 | 752 | 224 | 558 | 14.845 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Beginning BV of Equity | $ 75.690 | $ 74.989 | $ 75.244 | $ 75.024 | $ 75.480 | $ 76.123 |
| Cost of Equity | 7,62% | 7,62% | 7,62% | 7,62% | 7,62% | 7,62% |
| Equity Cost | 5.764 | 5.711 | 5.730 | 5.713 | 5.748 | 5.797 |

| | |
|---|---|
| Equity Invested | $ 75.244 |
| PV of Equity Excess Return | 17.279 |
| Value of Equity | 92.523 |
| Number of shares | 401,830 |
| Value Per Share | $ 230,25 |

| | |
|---|---|
| Risk-free rate | 2,220% |
| Beta | 1,199 |
| MRP | 4,500% |
| Cost of equity | 7,620% |
| Terminal Growth Rate | 1,800% |

| | |
|---|---|
| Current price | $ 242,55 |
| Potential | (5%) |

*Source: FLF analysis and Bloomberg*

Table 36: GS Valuation through multiples

| Company Name | Price Earnings Ratio FY16A | Price to Book Ratio FY16A | Price Earnings Ratio FY17F | Price to Book Ratio FY17F |
|---|---|---|---|---|
| JPMorgan Chase & Co | 13,00 | 1,30 | 13,29 | 1,34 |
| Wells Fargo & Co | 13,50 | 1,60 | 12,09 | 1,35 |
| Bank of America Corp | 12,90 | 0,90 | 12,90 | 0,94 |
| Citigroup Inc | 10,70 | 0,80 | 13,00 | 0,85 |
| Morgan Stanley | 12,50 | 1,10 | 12,91 | 1,16 |
| The Bank of New York Mellon Corp | 12,90 | 1,30 | 14,58 | 1,41 |
| State Street Corp | 13,20 | 1,60 | 15,02 | 1,75 |
| Comerica Inc | 16,90 | 1,50 | 14,49 | 1,44 |
| Raymond James Financial Inc | 16,30 | 2,20 | 15,17 | 2,01 |

| Company Name | Earnings per Share FY16A | Book Value per Share FY16A | Earnings per Share FY17F | Book Value per Share FY17F |
|---|---|---|---|---|
| The Goldman Sachs Group, Inc. | 16,58 | 203,31 | 16,09 | 210,51 |

| Equity Value per Share Multiples | Price Earnings Ratio FY16A | Price to Book Ratio FY16A | Price Earnings Ratio FY17F | Price to Book Ratio FY17F |
|---|---|---|---|---|
| High | 16,90 | 2,20 | 15,17 | 2,01 |
| Low | 10,70 | 0,80 | 12,09 | 0,85 |
| Mean | 13,54 | 1,37 | 13,72 | 1,36 |
| Median | 13,00 | 1,30 | 13,29 | 1,35 |

| Implied Equity Value per Share | Price Earnings Ratio FY16A | Price to Book Ratio FY16A | Price Earnings Ratio FY17F | Price to Book Ratio FY17F |
|---|---|---|---|---|
| High | 280,23 | 447,27 | 244,07 | 423,12 |
| Low | 177,42 | 162,64 | 194,51 | 178,93 |
| Mean | 224,59 | 277,85 | 220,68 | 286,53 |
| Median | 215,56 | 264,30 | 213,82 | 284,19 |

| Mean Equity Value across multiples | Equity Value per Share |
|---|---|
| High | 348,67 |
| Low | 178,38 |
| Mean | 252,41 |
| Median | 244,47 |

*Source: Bloomberg and FLF analysis*

Table 37: GS Credit exposure

| | Cash | | | OTC Derivatives | | | Loans and Lending Commitments | | |
|---|---|---|---|---|---|---|---|---|---|
| $ in millions | 6m17 | FY16 | FY15 | 6m17 | FY16 | FY15 | 6m17 | FY16 | FY15 |
| **Credit Exposure by Industry** | | | | | | | | | |
| Funds | $ - | $ 138 | $ 176 | $ 12.436 | $ 13.294 | $ 10.899 | $ 4.673 | $ 3.854 | $ 2.595 |
| Financial Institutions | 15.039 | 11.836 | 12.799 | 12.428 | 14.116 | 11.314 | 12.228 | 13.630 | 14.063 |
| Consumer, Retail & Healthcare | - | - | - | 1.072 | 773 | 1.553 | 42.876 | 30.007 | 31.944 |
| Sovereign | 77.213 | 95.092 | 62.130 | 7.602 | 7.019 | 7.566 | 507 | 902 | 419 |
| Municipalities & Non-profit | - | - | - | 3.069 | 2.959 | 3.984 | 663 | 709 | 628 |
| Natural Resources & Utilities | - | - | - | 2.899 | 3.707 | 4.846 | 24.657 | 25.694 | 24.476 |
| Real Estate | - | - | - | 197 | 85 | 205 | 15.179 | 13.034 | 15.045 |
| Technology, Media & Telecommunications | - | - | - | 1.598 | 4.188 | 1.839 | 30.777 | 33.232 | 36.444 |
| Diversified Industrials | - | - | - | 2.723 | 2.529 | 5.008 | 23.162 | 20.847 | 20.047 |
| Other (including SPV) | - | - | - | 2.437 | 2.455 | 3.212 | 15.604 | 12.301 | 13.941 |
| **Total** | **$ 92.252** | **$ 107.066** | **$ 75.105** | **$ 46.461** | **$ 51.125** | **$ 50.426** | **$ 170.326** | **$ 154.210** | **$ 159.602** |
| **Credit Exposure by Region** | | | | | | | | | |
| Americas | $ 49.429 | $ 80.381 | $ 54.846 | $ 15.585 | $ 19.629 | $ 17.724 | $ 128.801 | $ 115.145 | $ 121.271 |
| EMEA | 31.397 | 16.099 | 8.496 | 26.585 | 26.536 | 27.113 | 36.378 | 35.044 | 33.061 |
| Asia | 11.426 | 10.586 | 11.763 | 4.291 | 4.960 | 5.589 | 5.147 | 4.021 | 5.270 |
| **Total** | **$ 92.252** | **$ 107.066** | **$ 75.105** | **$ 46.461** | **$ 51.125** | **$ 50.426** | **$ 170.326** | **$ 154.210** | **$ 159.602** |
| **Credit Exposure by Credit Quality** | | | | | | | | | |
| AAA | $ 59.896 | $ 83.899 | $ 55.626 | $ 2.417 | $ 2.516 | $ 2.628 | $ 2.980 | $ 3.135 | $ 4.148 |
| AA | 15.936 | 8.784 | 4.286 | 14.695 | 14.110 | 16.440 | 8.947 | 8.375 | 7.716 |
| A | 14.782 | 13.344 | 14.243 | 11.356 | 13.447 | 10.706 | 28.835 | 29.227 | 27.212 |
| BBB | 1.508 | 971 | 855 | 10.769 | 15.026 | 11.732 | 50.505 | 43.151 | 43.937 |
| BB or lower | 130 | 68 | 95 | 6.777 | 5.544 | 8.124 | 78.842 | 69.745 | 76.049 |
| Unrated | - | - | - | 447 | 482 | 796 | 217 | 577 | 540 |
| **Total** | **$ 92.252** | **$ 107.066** | **$ 75.105** | **$ 46.461** | **$ 51.125** | **$ 50.426** | **$ 170.326** | **$ 154.210** | **$ 159.602** |

*Source: Statutory reports*

Table 38: Credit rating for Group's major entities

| | Moody's | S&P | Fitch |
|---|---|---|---|
| **GS Group Inc.** | | | |
| Short-term Debt | P-2 | A-2 | F1 |
| Long-term Debt | A3 | BBB+ | A |
| Subordinated Debt | Baa2 | BBB- | A- |
| Preferred Stock[4] | Ba1 | BB | BB+ |
| Ratings Outlook | Stable | Stable | Stable |
| **GS&Co.[5]** | | | |
| Short-term Debt | N/A | A-1 | F1 |
| Long-term Debt | N/A | A+ | A+ |
| Ratings Outlook | N/A | Stable | Stable |
| **Goldman Sachs International** | | | |
| Short-term Debt | P-1 | A-1 | F1 |
| Long-term Debt | A1 | A+ | A |
| Ratings Outlook | Stable | Stable | Stable |
| **Goldman Sachs Bank USA** | | | |
| Short-term Debt | P-1 | A-1 | F1 |
| Long-term Debt | A1 | A+ | A+ |
| Short-term Bank Deposits | P-1 | N/A | F1+ |
| Long-term Bank Deposits | A1 | N/A | AA- |
| Ratings Outlook | Stable | Stable | Stable |
| **Goldman Sachs International Bank** | | | |
| Short-term Debt | P-1 | A-1 | F1 |
| Long-term Debt | A1 | A+ | A |
| Short-term Bank Deposits | P-1 | N/A | F1 |
| Long-term Bank Deposits | A1 | N/A | A |
| Ratings Outlook | Stable | Stable | Stable |

*Source: Company presentation*

[4] Preferred Stock includes Group Inc.'s non-cumulative preferred stock and the Normal Automatic Preferred Enhanced Capital Securities (APEX) issued by Goldman Sachs Capital II and Goldman Sachs Capital III
[5] Focuses on the distribution of Goldman Sachs Funds

Table 39: Executive officers of The Goldman Sachs Group, Inc.

| Name | Role |
|---|---|
| Lloyd C. Blankfein | Chairman and Chief Executive Officer |
| David M. Solomon | President and Co-Chief Operating Officer |
| Harvey M. Schwartz | President and Co-Chief Operating Officer |
| R. Martin Chavez | Executive Vice President and Chief Financial Officer |
| Richard J. Gnodde | Vice Chairman |
| Pablo J. Salame | Vice Chairman |
| Gregory K. Palm | Executive Vice President, General Counsel and Secretary of the Corporation |
| Sarah E. Smith | Executive Vice President and Head of Global Compliance |
| John F. W. Rogers | Executive Vice President, Chief of Staff and Secretary to the Board |
| Edith W. Cooper | Executive Vice President and Global Head of Human Capital Management |

*Source: Statutory Reports*

Figure 36: GS's four business segments

*Source: Statutory reports and FLF analysis*

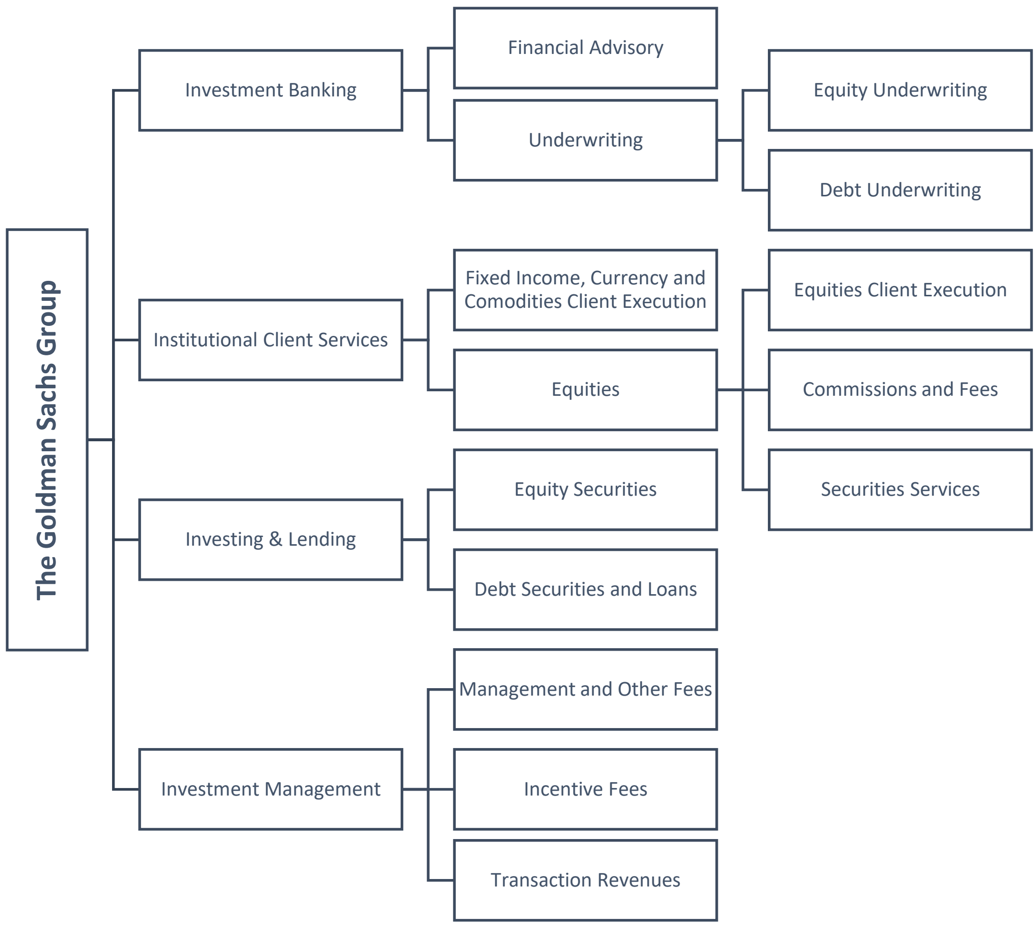
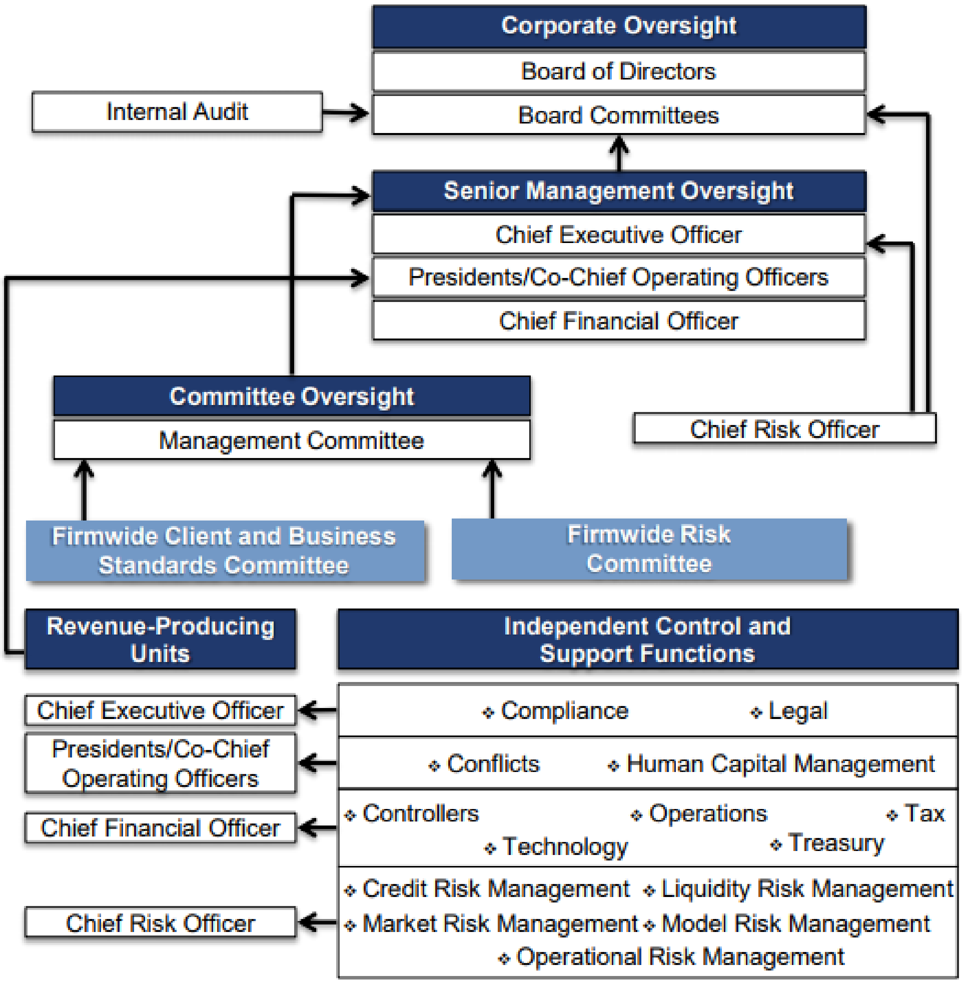


Figure 37: GS's organizational chart
*Source: Statutory reports*



# References


Beltrame, F. and Previtali, D. (2016), *Valuing Banks: A New Corporate Finance Approach*, 1st edition, Palgrave Macmillan

Buehler, K, Noteboom, P. and Williams, D. (2013), *Between deluge and drought: The future of US bank liquidity and funding: Rebalancing the balance sheet during turbulent times*, Working Paper, McKinsey & Company.

Damodaran, A. (1994), Damodaran on valuation: Security analysis for investment and corporate finance. 1st edition, John Wiley & Sons.

Damodaran, A (2009), *Valuing Financial Service Firms*, Working Paper, Stern School of Business.

Damodaran, A. (2012), *Investment Valuation: Tools and Techniques for determining the value of any asset*. 3rd edition, John Wiley & Sons.

Damodaran, A. (2012), *The Valuation of Financial Service Firms*, Working Paper

Day, A. L. (2001), *Mastering Financial Modelling, A practitioner's guide to applied corporate finance.* 1st edition, Prentice Hall

Department of Economic and Social Affairs, UN (2017), *World Economic Situation and Prospects, Monthly Briefing (July)*. Report

English, J. (2001), *Applied Equity Analysis: Stock Valuation Techniques for Wall Street Professionals*. 1st edition, McGraw-Hill Education

IMF World Economic Outlook April 2017 Database.

Koller, T., Goedhart, M. and Wessels, D. (2010), *Valuation, Measuring and Managing the Value of Companies*. 5th edition, McKinsey & Company.

Pinto, J. E.; Henry, E.; Robinson, T. R. and Stowe, J. D. (2010), *Equity Asset Valuation*. 2nd edition, CFA Institute Investment Series, John Wiley & Sons

PwC (2014), *Asset Management 2020. A Brave New World*. Report.

PwC (2014), *Retail Banking 2020: Evolution or Revolution?*. Report

Rees, M. (2008), *Financial Modelling in Practice: A Concise Guide for Intermediate and Advanced Level*. 1st edition, John Wiley & Sons.

Rezaee, Z. (2001), *Financial Institutions, Valuations, Mergers and Acquisitions: The Fair Value Approach*. 2nd edition, John Wiley & Sons

Santos, A. O. and Elliott, D. (2012), *Estimating the Costs of Financial Regulation*, International Monetary Fund

Sornette, D., Cauwels, P. and Smilyanov, G. (2017), *Can We Use Volatility to Diagnose Financial Bubbles? Lessons from 40 Historical Bubbles,* Swiss Finance Institute

The Goldman Sachs Group Inc.'s 10Q Filings from 2011 to 2Q17

The Goldman Sachs Group Inc.'s Annual Dodd-Frank Act Stress Test Disclosure from 2016 to 2017

The Goldman Sachs Group Inc.'s Annual Reports, 10K Filings and Accounts from 2011 to 2016.

The Goldman Sachs Group Inc.'s Liquidity Coverage Ratio Disclosures from 1Q16 to 2Q17

The Goldman Sachs Group Inc.'s Pillar 3 Disclosures from 2016 to 2017

Tjia, J. S. (2009), *Building Financial Models, the complete guide to designing, building, and applying projection models*. 2nd edition, McGraw-Hill Finance & Investing

Vleblg, J., Poddlg, T. and Varmaz, A. (2008), Equity Valuation: Models from Leading Investment Banks. 1st edition, John Wiley & Sons.

# Abbreviations

| | |
|---|---|
| $ | United States Dollar |
| $…k | Thousand U.S. Dollars |
| $…m | Million U.S. Dollars |
| $…bn | Billion U.S. Dollars |
| Δ | Variation |
| 6mxxA | Actual Figures as at 31 June 20xx |
| A | Actual |
| β | Beta |
| BS | Balance Sheet |
| BVPS | Book Value per Share |
| CAGR | Compound Annual Growth Rate |
| CapEx | Capital Expenditure |
| CAPM | Capital Asset Pricing Model |
| CBOE | Chicago Board Options Exchange |
| CDS | Credit Default Swap |
| CEO | Chief Executive Officer |
| CET | Common Equity Tier |
| CFA | Chartered Financial Analyst |
| CFFi | Cash Flow from Financing Activities |
| CFIn | Cash Flow from Investing Activities |
| CFOp | Cash Flow from Operating Activities |
| CFO | Chief Financial Officer |
| CIT | Corporate Income Tax |
| CR | Current Ratio |
| CRP | Country Risk Premium |
| D | Debt |
| D&A | Depreciations and Amortizations |
| DCF | Discounted Cash Flow |
| DecxxA | Actual Figures as at 31 December 20xx |
| DecxxF | Forecasted Figures as at December 20xx |
| E | Equity |
| EBIT | Earnings before Interest and Tax |
| EBITDA | Earnings before Interest, Tax, Depreciation and Amortization |
| EBT | Earnings before Tax |
| ECB | European Central Bank |
| EMEA | Europe, Middle East and Africa Region |
| EPS | Earnings per Share |
| ERM | Excess Return Model |
| ESG | Environmental, Social and Governance |
| E.U. | European Union |
| EV | Enterprise Value |
| EY | Ernst & Young |
| FCF | Free Cash Flow |
| FCFE | Free Cash Flow to Equity |
| FCFF | Free Cash Flow to the Firm |
| FICC | Fixed Income, Currency and Commodity |

| | |
|---|---|
| FinTech | Financial Technology |
| FSF | Financial Service Firm |
| FY | Fiscal Year |
| FYxxA | Financial Years Ended as at 31 December 20XX |
| FYxxF | Financial Years Forecasted for 31 December 20XX |
| g | Terminal Growth rate |
| G-SIB | Global Systemically Important Bank |
| GAAP | Generally Accepted Accounting Principles |
| GCLA | Global Cora Liquid Assets |
| GDP | Gross Domestic Product |
| GM | Gross Margin |
| GS | The Goldman Sachs Group, Inc. |
| HNWI | High Net Worth Individuals |
| I&L | Investing & Lending |
| IB | Investment Banking |
| ICS | Institutional Client Services |
| IM | Investment Management |
| IMF | International Monetary Fund |
| IPO | Initial Public Offering |
| IRP | Industry Risk Premium |
| ISEG | Lisbon School of Economics & Management |
| ISS | Institutional Shareholder Services, Inc. |
| JEL | Journal of Economic Literature |
| Kd | Cost of Debt |
| Ke | Cost of Equity |
| LT | Long Term |
| M&A | Mergers & Acquisitions |
| MiFID | Markets in Financial Instruments Directive |
| MRP | Market Risk Premium |
| NBV | Net Book Value |
| NEO | Named Executive Officer |
| NI | Net Income |
| NYSE | New York Stock Exchange |
| P/B | Price to Book Value Ratio |
| P/E | Price to Earnings Ratio |
| PL | Profit & Loss |
| PV | Present Value |
| PwC | PricewaterhouseCoopers |
| QE | Quantitative Easing |
| R | Return |
| RCF | Revised Capital Framework |
| Rd | Cost of Debt |
| Re | Cost of Equity |
| Rf | Risk Free Rate |
| Rm | Market Return |
| ROA | Return on Assets |
| ROCE | Return on Common Equity |
| ROE | Return on Equity |
| S&P | Standard & Poor’s |

| | |
|---|---|
| S.E.C. | U.S. Securities and Exchange Commission |
| SOP | Sum of Parts |
| ST | Short Term |
| STD | Standard Deviation |
| SWF | Sovereign Wealth Fund |
| SWOT | Strengths, Weaknesses, Opportunities and Threats |
| T | Corporate Income Tax Rate |
| TA | Total Assets |
| TSE | Total Shareholder’s Equity |
| U.K. | United Kingdom |
| U.S. | United States of America |
| VaR | Value at Risk |
| VIX | CBOE Volatility Index |
| WACC | Weighted Average Cost of Capital |
| yQxx | yth Quarter Results of 20xx |
| YoY | Year on Year |

# Disclosure

**This report was prepared by Francisco Felisberto, a student of the Master in Finance at ISEG Lisbon School of Economics & Management – University of Lisbon, exclusively for academic purposes. The author, is the single responsible for the information and estimates contained in this report and for the opinions expressed.**

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