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FUNDAMENTAL ANALYSIS OF WELLS FARGO & COMPANY

Master Thesis

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Annotation

The goal of the submitted thesis “Fundamental analysis of Wells Fargo & Company” is a valuation of the company based on the methods of fundamental analysis. The thesis is built on an investment philosophy firstly introduced by Benjamin Graham and afterwards improved by Warren Buffett. The author briefly introduces the reader into the banking regulatory framework in the United States, banking industry and bank business model. The practical part focuses on forecasting of financial statements and company specific issues. The analysis leads to consequent valuation of the company and issuance of the investment recommendation.

Anotace

Cílem diplomové práce „Fundamentální analýza Wells Fargo & Company” je ocenění společnosti na základě metod fundamentální analýzy. Celá práce je založena na investiční filozofii, kterou poprvé formuloval Benjamin Graham, a která byla následně rozvedena Warrenem Buffettem. Autor stručně uvádí čtenáře do systému bankovní regulace ve Spojených státech amerických, bankovního sektoru a obchodního modelu banky. Praktická část práce je zaměřena na předpověď finančních výkazů a dále se zabývá tématy specifickými pro Wells Fargo & Company. Analýza vede k ocenění společnosti a vydání investičního doporučení.

Keywords

fundamental analysis, cost of equity, bank, valuation, financial modelling, financial analysis, BASEL

Klíčová slova

fundamentální analýza, náklady vlastního kapitálu, banka, valuace, finanční modelování, finanční analýza, BASEL

Declaration

I hereby declare that I worked out the Diploma Thesis "Fundamental Analysis of Wells Fargo & Company", under the supervision of Ing. Dagmar Linnertová, Ph.D., and that I stated in all the literary sources and other specialist sources used according to the legislation, internal regulations of Masaryk University and internal management acts of Masaryk University and the Faculty of Economics and Business Administration.

Frankfurt, 5th of June 2017

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Author's Signature

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INTRODUCTION

Financial markets' efficiency bolstered by big data, globalization and self-motivation of market participants has become a decisive trend in the industry. Simple US exchange-traded funds performed very well in the last 5 years generating higher yields than the most famous hedge funds. One must ask if fundamental analysis makes sense in such an environment. The short answer is yes. It does.

A fundamental analysis is the reason why markets are efficient. And even though the search for mispriced securities is ever more difficult, it is not a futile exercise. Moreover, widely diversified ETFs generate high returns when markets grow; however, the genuine value is usually recognized when bears take over. Investors, in general, should be aware of two things – permanent capital loss and unexploited opportunities. ETFs avoid the former by diversification and widely accepted assumption of growing economies. However, when investing into an ETF, investors invest into many inferior companies with mediocre business models led by ordinary management teams. Therefore, their economic profit slumps rapidly especially when considering the power of compounding. All these reasons explain why fundamental analysis still seems sensible and its execution is not pointless.

The author's investment philosophy is based on the doctrine of Benjamin Graham and therefore does not consider short-term speculations as investing. The buy and hold approach ensures not only superior investment returns when done right, but also helps investors to keep calm during times of a high volatility.

The title of the thesis "Fundamental analysis of Wells Fargo & Company" clearly describes its purpose. Since the subject of the analysis is a bank, the regulatory and institutional framework is of a high importance. Dodd-frank Act, BASEL III and other regulatory authorities and agreements are thoroughly investigated, since their implications have significant impact on any bank based in the United States.

The goal of the paper is to analyse and value Wells Fargo & Company. The process of the appraisal is based on fundamentals and should result in a clearly stated investment recommendation. However, the search for an implied equity value is not an easy task. Except regulatory framework, the author has analysed industry and company specific metrics such as FED interest rates, GDP growth, market concentration as well as Wells Fargo's business model, competitive positioning, net revenues, costs, dividend policy and so on. An attention is also given to the cost of equity, which is the factor most companies' values are highly sensitive to.

In the end, the implied equity value and rationale of the investment case should instruct investors if it is sound to buy or sell the stock.

1 INSTITUTIONAL AND REGULATORY FRAMEWORK

This chapter aims to familiarize the reader with the author's investment philosophy, introduce him into the topic of a bank analysis and briefly outline the system of a bank regulation in the United States. All theoretical concepts are utilized in the practical part, which aims at valuation of Wells Fargo & Co.

1.1 Author's Investment Philosophy

This thesis is built on the investment philosophy of Benjamin Graham and his student Warren Buffett. The author questions perfect market efficiency and believes there are unexploited investment opportunities in the world. Indeed, the same thing is taught by the Nobel Prize winner Robert Shiller, whose influence can also be recognized in this paper. Existence of mispriced securities is also a cornerstone of the fundamental analysis, which is used throughout the whole paper.

All the statements about the market efficiency relate mainly to the United States. Even though the financial markets in the North America are the most developed in the world, in reality, they are still not completely frictionless[1]. Even Eugene Fama, the most famous supporter of efficient markets theory (EMH), acknowledges its inaccuracies[2][3]. Arguably, it is true that markets are being very close to being efficient and usually all historical information is priced in. Therefore, it is extremely difficult to beat the market using technical analysis. Given the current competitiveness, globalization and algorithmization of the financial markets, it is very challenging to beat the market using any method. However, the exercise is not futile as exampled by many fundamentally focused investors, who have been successful over many decades. As an example, it is possible to name Philip Fisher, Walter Schloss or Joel Greenblatt. For that reason, fundamental analysis is the strategy the author has decided to use to value Wells Fargo & Company. The efficient market hypothesis is widely accepted, but still subject to many controversies. In any case, it is not the goal of the thesis to comprehensively analyse the issue.

The goal of the paper is to analyse and value Wells Fargo & Co. (WFC). Hence, it is essential to understand the operating business model of a bank and its related activities and concepts such as bank regulation or valuation methods designed for financial services firms. The specific theory is comprehensively examined in the following chapters.

The author has decided not to proceed with the general theoretical description of the fundamental analysis due to specific focus and scope of the thesis. It is assumed that the reader has already grasped the concept and basic techniques of fundamental analysis. Furthermore, other types of security

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[1] Robert J. Shiller - Prize Lecture. *Nobel Prize* [online]. [cit. 2017-02-19]. From https://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2013/shiller-lecture.html

[2] Overpriced Index Funds Won't Go Away. *Bloomberg* [online]. 2016 [cit. 2017-03-13]. Available at: https://www.bloomberg.com/view/articles/2016-04-22/the-mystery-of-why-costly-index-funds-survive

[3] Are Markets Efficient? *Chicago Booth Review* [online]. 2016 [cit. 2017-02-19]. Available at http://review.chicagobooth.edu/economics/2016/video/are-markets-efficient1

analyses such as technical analysis and psychological analysis are also not comprehensively explained. Even though the author acknowledges their potential added value, they are presently not the main cause of the investigation.

1.1.1 The Four Pillars of Investing

The analysis of Wells Fargo & Company is based on a simple investment philosophy firstly interpreted by the *father of value investing* Benjamin Graham (1894 – 1976) and after that popularized by Warren Buffett. It consists of four pillars – circle of competence, competitive advantage, management and intrinsic value.

- **Circle of Competence**

  An understanding of a business model is a bedrock upon which all else is built. An investor needs the ability to correctly evaluate selected businesses. Companies, operations of which an analyst sufficiently grasped, belong to his circle of competence. It is hardly possible to reasonably value enterprises, which an analyst is not familiar with. The size of the circle of competence is not very important; knowing its boundaries, however, is vital[4].

  The complexity of a business model depends on a company in question. It may be argued that it is relatively simple to understand business models of McDonald's or Coca-Cola. However, it is incredibly difficult to grasp and incorporate all the publicly available information regarding the complex companies such as Siemens or Berkshire Hathaway. These corporations have either multiple divisions or many subsidiaries with diverse operations.

- **Competitive Advantage**

  The second pillar consists of a competitive advantage, which is expected to ensure company's success in the future. Warren Buffett likens competitive advantage to a medieval moat. If the moat widens every year, the company will be successful in the long-term. It does not necessarily mean that next year's profit will be higher than the last year's, because company may be subject to other external factors. However, shareholders have high chance of not being disappointed in the long-term[5].

  An analysis of a business model incorporates also a search for a competitive advantage. Only companies with a definite edge over their competitors may sustainably create value in the long-term. Otherwise, they are either forced to go out of business or find themselves in an

[4] Buffett and Munger on the Circle of Competence. *Warren Buffett* [online]. 2016 [cit. 2017-03-13]. Available at: http://www.warrenbuffett.com/buffett-and-munger-on-the-circle-of-competence/

[5] One quote from Warren Buffett is the perfect advice for investing in the age of Uber and Netflix. *Business Insider* [online]. 2016 [cit. 2017-02-19]. Available at: http://www.businessinsider.com/buffett-on-moats-2016-4

almost perfectly competitive industry. In any case, it is certainly difficult to argue for a long-term investment into a company without a legitimate competitive advantage.

Wells Fargo is widely regarded as the strongest bank in the United States thanks to several competitive advantages it has been able to maintain. They are further scrutinized in the practical part of the thesis in order to evaluate their quality and sustainability.

- **Management**

The third rule is to buy shares of companies managed competently. There are many companies with great ideas, but the crucial part is the execution itself. Investors usually do not substitute management, so it is necessary to invest in companies with driven and honest leaders.

In addition, actions taken by the management must benefit the shareholders. The obvious example of management benefiting itself is unreasonably expensive acquisition. Investors should avoid investing in companies, management of which boosts its power on their expense[6]. There are many other examples of management actions, which indirectly harm shareholders. The company, which piles large amount of cash also hurts shareholders, since they cannot invest the money elsewhere and thus incur economic losses due to opportunity cost. Some investors as Yasuaki Fujine consider the management as the most crucial variable when deciding about the investment, especially in terms of small and medium enterprises[7].

WFC has been managed very well in the past years. The company has paid stable dividends, repurchased shares and experienced management behaved competently. However, current scandal revealed extremely aggressive selling strategies and fraudulent behaviour. For that reason, the corporate governance and incentive program must also be thoroughly investigated.

- **Value vs. Price**

Only after an investor understands a business model, finds a company having a competitive advantage, which is led by competent and honest management, should he proceed with a valuation. The process should reveal the consistency or the difference between the actual market price and the estimated intrinsic value of the company. Moreover, investors should be aware of the fact that the intrinsic value is subjective and largely sensitive to the assumptions. Therefore, the utilization of the margin of safety is appropriate. Depending on the method used for calculating the cost of equity, the difference between the market price and the

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[6] Warren Buffett's 4 Rules for Stock Market Success. *Fool.com* [online]. 2014 [cit. 2017-02-19]. Available at http://www.fool.com/investing/general/2014/07/06/warren-buffetts-4-rules-for-stock-market-success.aspx

[7] Rountable: How to find Japan's Small-Cap Gems. *Japan Inc Communications, Inc.* [online]. 2002 [cit. 2014-09-27]. Available at http://www.japaninc.com/article.php?articleID=849

intrinsic value should be at least 20% in order to avoid excessive risk caused by the inaccuracy of the forecasts and assumptions[8].

Wells Fargo is closely tracked blue-chip stock. The company is according to Bloomberg Professional Service followed by almost 40 qualified analysts. However, that does not have to necessarily mean that Wells Fargo & Co. is priced fairly.

„Price is what you pay, value is what you get. " - Warren Buffett

1.2 Bank Business Model

Wells Fargo is a community-based financial services corporation with an exposure to banking, insurance and investments. In order to value such an enterprise, firstly it is necessary to grasp the theoretical framework of its business model.

A bank, as every profit-seeking institution, should serve its owners - shareholders and maximize the value for them. However, shareholders are not a uniform group and certainly do not share same preferences. Some of them would like to own the company for one quarter and would exchange high earnings in the long-term for very high earnings in the short-term. Nevertheless, competent management understands that their goal is to maximize the value for shareholders in the long-term, improve company's competitive advantage and thus secure its survival. That is also consistent with the investment philosophy introduced in the first chapter of the thesis.

From an economic point of view, banks are undoubtedly one of the most important institutions in the economy. Since their primary objective is to transfer funds from those who have excess funds available to those who have a shortage of available funds, they materially help the financial system to work properly and efficiently. From a valuation point of view, it is essential to understand the main key drivers of the profit generation in the industry. Nonetheless, it is worth underlining that as Paul Volcker, former Federal Reserve Chairman used to say, fiduciary responsibility is at the very core of every banking organization[9]. That is important in terms of corporate governance and ethics in particular. These issues do not enter valuation directly; however, they certainly affect the intrinsic value of the company in the long-term.

For valuation purposes, an analyst must understand revenue-generating activities and grasp the rationale behind such activities. Bank valuation cannot be built solely on financial statements analysis, imprudent regression analysis based only on historical data and trivial discounting. An analyst must understand real activities and steps which do take place in the bank. Only then is one able to perform a sensible analysis. Valuation is based on forecasts, which are by definition not accurate. Therefore, the

[8] A Closer Look At Warren Buffett's 'Price Is What You Pay, Value Is What You Get' Quote. *ValueWalk* [online]. 2014 [cit. 2017-02-19]. Available at http://www.valuewalk.com/2014/09/warren-buffett-famous-quotes/

[9] MASARI, Mario, Gianfranco GIANFRATE a Laura ZANETTI. The valuation of financial companies: tools and techniques to value banks, insurance companies, and other financial institutions. Wiley: Wiley, 2014. ISBN 9781118617335, page 1

process itself is and always will be subjective. Hence, deep understanding and even sane intuition may reduce the final error.

1.2.1 Types of Banks

There are three basic types of banks - universal banks, commercial banks and investment banks. All of them differ from each other not only by the structure of their financial statements, but also by their operations, public relations, client attitude and so on.

- **Commercial banks**

  By the definition of the Financial Times, commercial bank is a financial institution providing services for businesses, organizations and individuals[10]. Services provided by a commercial bank include current, deposit and savings accounts, loans, mortgages, credit and debit cards, credit lines etc.

  The main activity of a commercial bank is to collect deposits and provide loans. By doing so, a bank does not necessarily create value. But the majority of inflowing deposits have a short-term maturity, whereas offered loans have long-term maturity. In addition, deposits are very close to a risk-free asset, which cannot be said about loans. Mainly, it is the transformation of maturity and risk (spreading, pooling), which allow commercial banks to create value.

  The most important revenue item for a majority of commercial banks is a net interest income. Commercial banks make profit by charging high interest on loans while being charged low interest on deposits. The difference between the mentioned average interest rates is called interest spread, and is highly tracked by analysts[11]. Therefore, banks are sometimes called "spread business"[12]. The related metric is net interest margin (NIM), which shows net yield on all interest-earnings assets. The NIM is as well one of the key metrics in the industry.

  The most globally famous commercial banks are HSBC or Wells Fargo, which is also subject of this thesis. Its belonging to this category is further scrutinized in the practical part, especially in terms of several important ratios such as loans to total assets or net interest income to total revenue.

  According to the Bank for International Settlements (BIS), commercial banks tend to make better, more stable profits than their investment and trading peers. In terms of balance sheet, approximately two-thirds of the assets consist of loans. However, it is important to note that

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[10] What is a commercial bank? *Market Business News* [online]. 2014 [cit. 2017-02-21]. Available at http://marketbusinessnews.com/financial-glossary/commercial-bank/

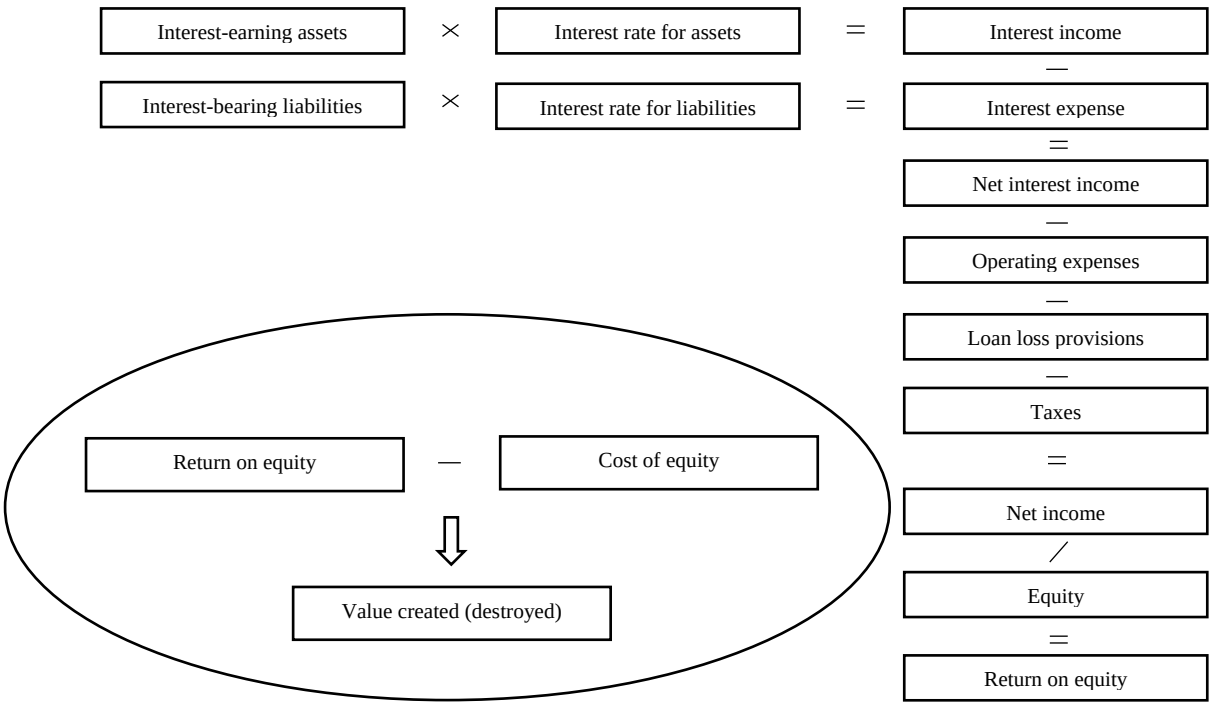
[11] Commercial Bank: Definition, Function, Credit Creation and Significances. *Economic Discussion* [online]. 2013 [cit. 2017-02-21]. Available at http://www.economicsdiscussion.net/banks/commercial-bank-definition-function-credit-creation-and-significances/607

[12] STERN, Carl W. a Michael S. DEIMLER. *The Boston Consulting Group on strategy*. 2nd ed. Hoboken, N.J.: John Wiley, c2006. ISBN 9780471757221, page 112

strategy of every individual bank varies. Commercial banks may be further divided into retail and wholesale funded. Retail-funded commercial bank relies on deposits on average for two-thirds of their funding. On the other hand, wholesale-funded banks get on average more than a half of necessary funds from bonds and interbank borrowings[13]. The retail and wholesale funded banks are affected by different factors. The former one is dependent mainly on its customers and the ability to attract deposits, whereas the latter one is highly dependent on the financial markets.

The profitability of commercial banks is driven by several factors. The most relevant are interest rates, which a bank pays on deposits and charges on loans. As a matter of course, not all the provided loans are fully repaid. Hence, every bank has to account for this in advance and create so called loan loss provisions, which reduce the profitability. Loan loss provisions respectively credit loss provisions are also known as a cost of risk. The third major category is an operating expense (non-interest expense), from which the highest are usually wages, salaries and employee compensations. Figure 1.1 shows the value creation (destruction) chain in a commercial bank.

Figure 1.1: The determinants of retail banking profitability



Source: Massari, Gianfrate, Zanetti, 2014

[13] Consumer Banks Are Most Attractive Business Model: BIS. *Bloomberg* [online]. 2014 [cit. 2017-02-21]. Available at: http://www.bloomberg.com/news/articles/2014-12-07/consumer-banks-are-most-attractive-business-model-bis

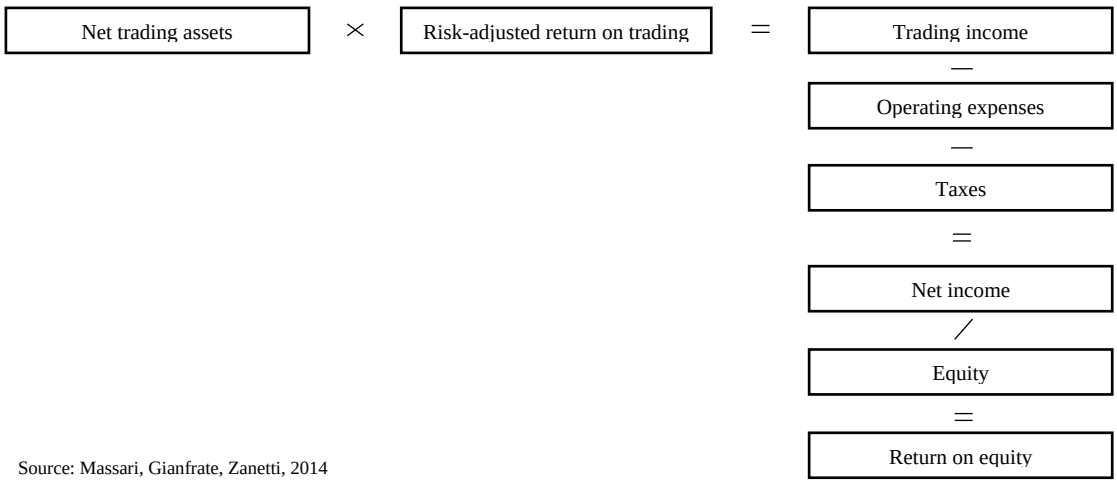
- **Investment Banks**

The main business of an investment bank is to underwrite securities, perform as an advisor during M&A activities, manage assets, trade securities etc. They differ from commercial banks by targeting different segments of customers and performing dissimilar operations. While investment banks customers are usually high-net worth individuals and large corporations, which they serve with tailor-made advisory services. Furthermore, investment banks' core business is not providing loans and collecting deposits. That is consequently reflected on the both sides of their balance sheets.

The best-known investment banks are household names like Goldman Sachs, Morgan Stanley or Deutsche Bank. However, it is oftentimes difficult to decide, if the bank is investment or commercial. Many gigantic financial corporations, such as JP Morgan Chase, also provide wide variety of investment banking services, even though they are generally considered to be focused on the commercial segment.

The income of investment banks is usually dependent on fees and commissions and on the success of bank's traders. Hence, the most relevant revenue-generating items are net fee and commission income and net trading income. Even though trading is primarily an investment banking activity, commercial banks usually also have some exposure to the business, but mainly related to hedging actions. Proprietary trading involves trading of a wide variety of securities on the public exchanges and OTC markets[14]. The activity is usually riskier than other bank's activities, but also offers high return potential.

Figure 1.2: The determinants of trading profitability



Source: Massari, Gianfrate, Zanetti, 2014

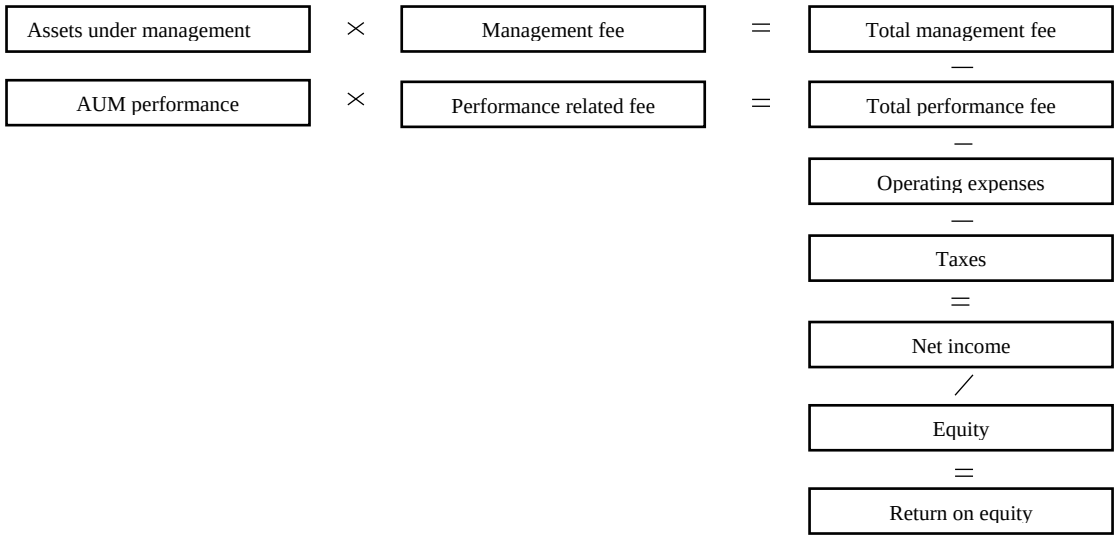
[14] MASARI, Mario, Gianfranco GIANFRATE a Laura ZANETTI. The valuation of financial companies: tools and techniques to value banks, insurance companies, and other financial institutions. Wiley: Wiley, 2014. ISBN 9781118617335, page 3

The Figure 1.2 exhibits the determinants of trading profitability. The key drivers of profitability of fee-based activities are hard to depict in one figure due to their large quantity and relationships, which do not have to be necessarily clear at the first glance. However, some fees may be set by the industry standard e.g. fees charged for the issuance of securities.

The last source of income common for investment banking stems from asset management. A bank manages investor's wealth in order to meet his or her specific investment goals. They charge two kinds of fees for such activities. The first one is dependent on the volume of assets under management (AUM). The second one depends on the actual performance of the assets themselves[15]. Very common fee structure is 2/20, which means 2% flat fee calculated on all the assets under management and 20% fee on all profits.

Recently, however, there is a great pressure on the reduction of the fees. Active asset management after the deduction of fees often does not outperform simple ETFs and portfolio managers have been having hard time justifying high fees. The trend materialized in the form of money flows from the hedge funds to ETFs. The latter overtook the former in 2015, which was unthinkable just a dozen of years ago[16].

Figure 1.3: The determinants of profitability in asset management



Source: Massari, Gianfrate, Zanetti, 2014

[15] MASARI, Mario, Gianfranco GIANFRATE a Laura ZANETTI. The valuation of financial companies: tools and techniques to value banks, insurance companies, and other financial institutions. Wiley: Wiley, 2014. ISBN 9781118617335, page 9

[16] ETFs attract more than $3.2tn to pass hedge funds. *Financial Times* [online]. 2016 [cit. 2017-03-13]. Available at: https://www.ft.com/content/6c36412a-a2da-11e6-aa83-bcb58d1d2193

1.3 Bank Regulatory Environment in the United States

Banks accumulate substantial amount of funds from consumer and corporate clients, which may be at risk given the financial distress of the financial institution. For that reason, regulator, usually the central bank or another official authority, determines specific limits on certain risks, which banks cannot exceed.

That applies especially because deposits till $250,000[17] are insured by the Federal Deposit Insurance Corporation, which is consequently backed by the full faith and credit of the United States government[18]. If there were no regulatory requirements, governments would become one of the largest unsecured creditors in the world. Naturally, no government would voluntarily accept such a burden. As a result, banks must comply with special requirements and laws, which would be unacceptable for other industries. That is a significant constraint altering the intrinsic value of every bank not excepting Wells Fargo. Due to a significant impact on almost every important metric and bank activity, the regulatory framework is comprehensively analysed. Moreover, even though that not all the regulatory requirements are set in a quantitative form, an analyst should be aware of the rules in order to compute the implied equity value based on reasonable assumptions.

1.3.1 Regulatory Agencies in the United States

There are two levels, in which regulation may be conducted - federal level and state level. State banks receive their charter from a state agency, usually the department of banking or division of a financial institution, which also conducts the regulation and inspection. Alternatively, banks may choose to receive a national charter and be exempt from many state banking laws and regulatory rules. By law, nationally chartered banks must be members of the Federal Reserve System. State chartered banks may or may not be part of the FED[19]. Further specific information may be found in the Table 1.1[20].

The bank regulation in the United States is highly fragmented. There are several agencies, which are responsible for regulation, inspection and oversight. Among others it is Federal Reserve (FED), Federal Deposit Insurance Corporation (FDIC), Office of the Comptroller of the Currency (OCC) and Consumer Finance Protection Bureau (CFPB).

Federal Reserve or Federal Reserve System is the central bank of the United States. It is responsible for oversight of the United States banking holding companies, foreign banking organizations operating

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[17] Dodd-Frank Wall Street Reform and Consumer Protection Act. *SEC* [online]. 2010 [cit. 2017-02-21]. Available at: https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf

[18] Symbol of Confidence. *FDIC* [online]. 2010 [cit. 2017-02-21]. Available at: https://www.fdic.gov/consumers/assistance/protection/depaccounts/confidence/symbol.html#Full

[19] What is the Fed: Supervision and Regulation. *FRBSF* [online]. 2013 [cit. 2017-02-21]. Available at: http://www.frbsf.org/education/teacher-resources/what-is-the-fed/supervision-regulation/

[20] Law Business Research Ltd. *The Banking Regulation Review*. 4th. London: Gideon Roberton, 2013. ISBN 978-1-907606-59-5, page 871

in the United States, and state-chartered member banks of the Federal Reserve System[21]. In other words, FED regulates almost all the banks except national banks, which are regulated by the OCC. Even though national-charter holders are not regulated by the Federal Reserve, they must be members of Federal Reserve System[22].

Federal Deposit Insurance Corporation offers insurance of deposits up to a specific amount in the event of a bank failure. Every bank which chooses to carry FDIC insurance falls under the supervision and authority of the Federal Deposit Insurance Corporation. In addition, also banks, which are not supervised by the FED or the Office of the Comptroller of the Currency, are under close watch by the FDCI. The body regulates certain bank activities to protect and preserve federal deposit insurance fund. In order to enhance own reputation and security of the customers, vast majority of banks choose to have the deposits insured.

The history of the **Office of the Comptroller of the Currency** dates back to times of Abraham Lincoln. *National Currency Act* and *National Bank Act* came into effect in 1863 and 1864, respectively and established the OCC, which is also the U.S. Treasury Department. Currently, there are over 1000 national chartered banks[23] in the national banking system under the supervision of the OCC[24].

The goal of the **Consumer Finance Protection Bureau** is to protect consumers and help them to understand their rights and responsibilities. At the same time, CFPB supervises banks and obliges them to disclose information clearly[25].

Table 1.1: Regulation Overview

Institution type	Chartering agency	Primary federal regulator	Secondary federal regulator
Federal charter			
National bank	OCC	OCC	FED, FDIC
Federal savings bank	OCC	OCC	FDIC
State charter			
State non-member bank	State agency	FDIC	-
State member bank	State agency	FED	FDIC
State savings bank	State agency	FDIC	-

Source: Law Business Research, 2013

[21] Banking Supervision and Regulation. *Federal Reserve* [online]. 2017 [cit. 2017-02-21]. Available at: https://www.federalreserve.gov/econresdata/bsrstaff.htm

[22] Are all commercial banks regulated and supervised by the Federal Reserve System, or just major commercial banks? *FRBSF* [online]. 2006 [cit. 2017-02-21]. Available at: http://www.frbsf.org/education/publications/doctor-econ/2006/november/commercial-banks-regulation/

[23] National Banks. *OCC* [online]. 2016 [cit. 2017-02-21]. Available at: http://www.occ.treas.gov/topics/licensing/national-bank-lists/index-active-bank-lists.html

[24] Law Business Research Ltd. *The Banking Regulation Review*. 4th. London: Gideon Roberton, 2013. ISBN 978-1-907606-59-5, page 522

[25] Consumer Financial Protection Bureau. *USA.gov* [online]. 2017 [cit. 2017-02-21]. Available at: https://www.usa.gov/federal-agencies/consumer-financial-protection-bureau

The bank regulation has been going through a large amount of changes over time. However, there are two most important documents for the United States banks which came into effect recently - *Dodd-Frank Wall Street Reform and Consumer Protection Act* (the Dodd-Frank Act) and the *Third Basel Capital Accord*. The latter one is commonly known as BASEL III.

1.3.2 Dodd-Frank Wall Street Reform and Consumer Protection Act

The Dodd-Frank Act is the most drastic overhaul of the United States financial regulation since 1930s. The Act is resulting in a fundamental change to the shape and scope of the regulation. In addition, it adds new regulation in systemic risk oversight, investor protection, credit rating agencies, securitization and so on. Majority of these changes is directly or indirectly connected with banks' operations.

There are three most important changes, which have material effect on banks' business model. The Act established The Financial Stability Oversight Council, which oversees banks and also non-bank financial services firms and warns Federal Reserve if any of them develops to be too big. This prevents another AIG from becoming "too big to fail" with all the consequences.

The Title VI of the Act or so-called Volcker Rule effectively separates commercial and investment function of the bank and virtually forces banks to stop trading with customers' deposits. It also bans banks from using or owning hedge funds and private equity firms for their own profit. The Volcker Rule was widely opposed by banks due to obvious reasons, but was finally implemented in June 2015[26].

The Act also regulates the trigger of the financial crisis in 2008. Risky derivatives such as credit default swaps (CDS) must be regulated by Securities Exchange Commission (SEC) or the Commodity Futures Trading Commission. In this way, excessive risk-taking can be identified and brought to authorities' attention before a major crisis occurs[27].

The new regulation took shape in reduced profitability of banks and also in lower risk within one of the most important sectors of the economy. The full text of the Dodd-Frank Act has more than 2,300 pages[28] and it is not the goal of this thesis to elaborate on all the points stated in the most comprehensive financial regulatory reform since the Great Depression. Moreover, it should be mentioned that regulation is usually tardy, since financial industry has been developing progressively.

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[26] What Is the Dodd-Frank Wall Street Reform Act? *The Balance* [online]. 2017 [cit. 2017-02-21]. Available at: https://www.thebalance.com/dodd-frank-wall-street-reform-act-3305688

[27] Dodd-Frank Wall Street Reform and Consumer Protection Act. *SEC* [online]. 2010 [cit. 2017-02-21]. Available at: https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf

[28] Four Years of Dodd-Frank Damage. *Wall Street Journal* [online]. 2014 [cit. 2017-02-21]. Available at: http://www.wsj.com/articles/peter-wallison-four-years-of-dodd-frank-damage-1405893333

1.3.3 BASEL III and beyond

The second extremely important regulatory framework is the BASEL III. The Third Basel Agreement does not apply only to the United States institutions, but is effective in certain countries all over the world.

BASEL III is a comprehensive reform developed to strengthen the regulation, supervision and risk management of the banking sector. Its foundations are built on the antecedent document *International Convergence of Capital Measurement and Capital Standards*, commonly known as BASEL II[29]. The effectiveness of BASEL III has been gradually phased in during 2013 - 2018 period. On the 1st of January 2019, the agreement should be fully effective.

The Basel Framework consists of three pillars. Pillar 1 implements calculations of regulatory capital requirements for credit, market and operational risk. Pillar 2 sets out a process through which a bank should assess its capital adequacy and the framework which is being followed by a regulator assessing risks taken by banks. The Pillar 3 establishes the disclosure requirements aiming at market discipline. There are several sections, which will be thoroughly elaborated since they materially affect banks' core business and their intrinsic value.

1.3.4 Capital & Liquidity Requirements

Capital requirements constitute another eminent reason, why valuation of the financial services firms is different from the valuation of non-financial companies. The requirements affect not only the way a bank operates, but also how much equity it is obliged to retain in order to meet the relevant requirements. Consequently, not all the "free-cash flow" which bank generates is actually freely distributable to banks' shareholders.

Shareholders' equity serves as a buffer to absorb unexpected losses in case of a distress. As a matter of course, it also helps to fund banks' ongoing operations. According to BASEL III, total regulatory capital consists of the following elements:

- Tier 1 Capital (going-concern capital)
  - Common Equity Tier 1 (CET1)
  - Additional Tier 1 (AT1)
- Tier 2 Capital (gone-concern capital)

There is a single set of criteria, which have to be met, before the inclusion of the item in the relevant category[30]. **Tier 1 Capital** must exhibit shareholders' equity characteristics from the economic point of view. That means that Tier 1 Capital must be able to absorb potential losses

[29] Basel III: international regulatory framework for banks. *BIS* [online]. 2016 [cit. 2017-02-21]. Available at: http://www.bis.org/bcbs/basel3.htm

[30] Basel III: A global regulatory framework for more resilient banks and banking systems. *BIS* [online]. 2011 [cit. 2017-02-21]. Available at: http://www.bis.org/publ/bcbs189.pdf

while keeping the bank operating. It is divided into two subcategories - Common Equity Tier 1 and Additional Tier 1.

Common Equity Tier 1 or core capital is the highest quality capital, because it is able to instantly absorb any losses which a bank incurs. It consists of common stock, accumulated other comprehensive income, retained earnings, minority interest and regulatory adjustments. CET1 cannot bear specific burdens and must be unsecured.

Additional Tier 1 or non-core capital has a lower quality than CET1, since it does not comply with all of the strict requirements desired for CET1. Hybrid securities may be used as an example of the item included in the category. Hybrid securities are positioned on the border between equity and debt securities.

Tier 2 Capital or gone-concern capital should be available to satisfy creditors in case of default. It consists of specific items that meet the criteria for inclusion in Tier 2 Capital e.g. subordinated debt, undisclosed reserves, revaluation reserves etc.

Due to the fact that banks are usually rooted deeply in the economy, regulators' objective is to keep them well-funded. Hence, the regulatory body usually requires banks to retain specific capital ratios higher than the given threshold. Namely, Common Equity Tier 1 must be at least 4.5% of risk-weighted assets at all times. Furthermore, Tier 1 Capital must be at least 6.0% of risk-weighted assets at all times. Finally, total capital must be at least 8.0% of risk-weighted assets at all times. The formula for the calculation of the percentage is stated below.

Equation 1.1: Capital adequacy ratio

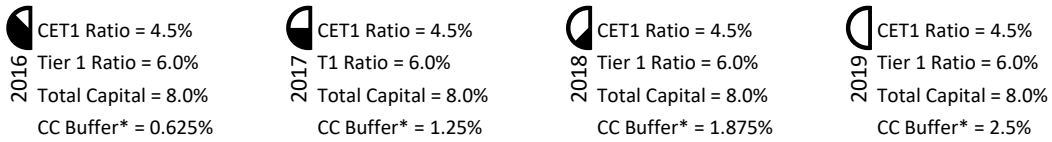
$$CAD = \frac{Capital}{RWAs}$$

Where *CAD* is the capital adequacy ratio,
Capital is the capital in question,
RWAs are the risk-weighted assets[31].

In addition, Basel Committee on Banking Supervision instituted **capital conversation buffer**. The reason behind this is to build up reserves in good times which could be drawn down in the periods of a financial distress. Furthermore, the rule should ban banks from paying out high dividends in a crisis as happened in 2007. If the capital conservation buffer is drawn down under the regulatory minimum, a bank must look to rebuild it and thus reduce discretionary distribution of earnings. Capital conservation buffer is set to 2.5%. That brings the minimum CET1 ratio to 7%, Tier 1 Capital ratio to 8.5% and Total Capital ratio to 10.5%.

[31] MEJSTŘÍK, Michal, Magda PEČENÁ a Petr TEPLÝ. *Bankovnictví v teorii a praxi: Banking in theory and practice*. Praha: Karolinum, 2014. ISBN 978-80-246-2870-7, page 274

Figure 1.4: BASEL III phase-in arrangements



* Capital conservation buffer, Source: BIS

Banks may be subject to huge losses during recessions when their debtors start to default. That is multiplied if a downturn is preceded by a period of an excessive credit growth. Thus, BASEL III institutes the **countercyclical buffer** which may or may not be imposed. The buffer should take into account specific macro-financial factors and may vary between 0% and 2.5% of RWAs[32].

The final, partly independent, non-risk-based rule is the **leverage ratio**, which will be instituted in the future. Its required value is still not certain. Bank for International Settlements tested 3% ratio, but also announced that minimum leverage ratio may be as high as 5%. Leverage ratio is calculated as Tier 1 Capital divided by all on-balance sheet and off-balance sheet assets. That should ensure that the banks will not hold large amounts of assets with an administratively assigned low risk-weight[33]. Similarly, it should prevent management to establish unnecessary SPVs.

Strong capital requirements are a necessary condition, but are not sufficient condition for a stable banking sector. The second very important condition is an adequate liquidity. In the past, however, there were no internationally accepted standards and liquidity requirements. For that reason, BASEL III has introduced global liquidity standards.

Liquidity Coverage Ratio is intended to promote resilience to potential liquidity disruptions over a one month horizon. It ensures that sufficient levels of high-liquidity assets are available for thirty days in a severe stress scenario. It assumes significant downgrade of the institution's public credit rating, a partial loss of deposits, loss of unsecured wholesale funding and other serious challenges.

Secondly, a bank must retain a minimum amount of stable sources of funding in order to comply with **net stable funding ratio**. The purpose is to reduce the likelihood that disruptions to a bank's usual sources of funding would disrupt its liquidity position in a serious way. Naturally, supervisors use a wide variety of monitoring tools to identify potential issues before they severely escalate[34]. The current trend worldwide forces banks to diversify their sources of funding, which should help them retain sufficient liquidity all the time. Therefore, the difference between banks funded by deposits and those funded by the issuances of bonds is narrowing.

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[32] Basel III: A global regulatory framework for more resilient banks and banking systems. *Bank for International Settlement* [online]. 2011 [cit. 2017-02-26]. Available at: http://www.bis.org/publ/bcbs189.pdf, page 54

[33] Leverage Ratio for Banks Can Rise as High as 5%, BIS Says. *Bloomberg* [online]. 2015 [cit. 2017-02-26]. Available at: http://www.bloomberg.com/news/articles/2015-12-06/leverage-ratio-for-banks-can-be-raised-as-high-as-5-bis-says

[34] Basel III summary. *IBM* [online]. 2015 [cit. 2017-02-26]. Available at: https://www.ibm.com/support/knowledgecenter/SSN364_8.8.0/com.ibm.ima.tut/tut/bas_imp/bas3_sum.html

2 VALUATION THEORY

Valuation is a final step of the fundamental analysis. Comparing the implied share price and the current share price is, however, the easiest action of all the process. Knowing what an asset is worth and especially what determines that value is a pre-requisite for an intelligent decision making[35]. Valuation models include many assumptions, which should be backed either by data or by reasonable explanations. Otherwise, the value of the company is nothing but guesswork and one should not rely on the results.

There are numerous reasons for estimating the value of a company such as IPO, divesture, merger, acquisition, taxation purposes, debt issuances, liquidation or management motivation[36]. This thesis is focused on the valuation of a bank for the purpose of a potential investment. Thus, corresponding techniques are used.

2.1 Financial Modelling

In order to reasonably value a company, one is recommended to create a valuation model. The model is most commonly made in Microsoft Excel, since it provides an analyst with powerful tools and relatively simple execution. The value and consequently the price of any asset reflect expected future cash-flows, which will be available to the owners. The banks are no exception.

In order to be able to predict reasonable cash-flows, it is recommended to create the three statements model. An analyst simply predicts how the financial statements of the company will look like and discounts expected future cash-flows, dividends or any other metric being used for valuation. This process is called financial modelling. According to Business dictionary, financial modelling is a mathematical representation of key financial and operational relationships[37]. Its ultimate goal is to show an analyst how the value of the company reacts to the different economic situations and events. Financial model helps an analyst to understand what the key drivers of the business are and to show changes in a company's value under different assumptions.

Detail, in which analysts examine companies, differs. It is necessary to find the right detail in which it is sound to carry out an analysis. If the model is too complicated, it is very easy to get confused and make unreasonable assumptions. On the other hand, if the model is not granular enough, even small changes of particular items like total loans growth would have huge impact on the estimated intrinsic value. When analysing a company, one should take into consideration all the information available, but not all the information will enter directly into the model.

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[35] What is Valuation? *NYU Stern* [online]. 2014 [cit. 2017-02-19]. Available at http://pages.stern.nyu.edu/~adamodar/New_Home_Page/background/valintro.htm

[36] What is a valuation? Definition and meaning. *Market Business News* [online]. 2016 [cit. 2017-02-19]. Available at http://marketbusinessnews.com/financial-glossary/valuation-definition-meaning/

[37] Financial Model. *Business Dictionary* [online]. 2008 [cit. 2017-02-19]. Available at http://www.businessdictionary.com/definition/financial-model.html

Furthermore, a model must be internally and externally consistent. In terms of internal consistency, there are four important categories: consistency between forecasts and historical data, consistency between income statement and balance sheet data, consistency between assets and liabilities side on the balance sheet and consistency between financial and operating forecasts[38]. There are three main categories of consistency regarding the external factors: consistency with macroeconomic outlook, competitive dynamics and business plan.

Valuation of a company has never been an unbiased calculation of the intrinsic value. Even the intrinsic value itself is not an objective measure and will differ for dissimilar investors, since they may have different opportunity cost and assumptions. The author based the analysis on the historical data and all the available public information until the valuation date which is 15th of January 2017. However, forecasting should not be based only on the past data. Therefore, some items are forecasted using the hard-coded growth rates or other reasonable assumptions, which represent author's opinion and experience. Having said that, it is important to have in mind the primary goal of the analysis, which is to closely approach the intrinsic value. The precise calculation to two or more decimal places is by definition inappropriate.

2.2 Bank Valuation

Banks are very specific companies and differ from all the manufacturing and other firms in wide variety of ways. The distinct business model and operating activities must be taken into account when valuing a bank. This chapter analyses particular differences in both financial statements and operations. In the second part of the chapter, bank valuation models are described.

There are two main issues regarding a bank valuation. The first one is that the cash-flows to financial services firms cannot be easily estimated. The important items like working capital, debt or capital expenditures are not clearly defined, which prevents using traditional methods. The second issue is a regulatory framework. Banks may be profitable and generate excess cash, but it is possible that due to the regulatory requirements shareholders cannot extract the cash from the company.

- **Cash-flows cannot be easily estimated**

  Most financial services firms have very high debt-to-equity ratio and if common practices were used, banks would seem extremely risky. However, that is not always the case. Core business of banks is to gather deposits, which are reported as debt and give out loans, which are reported as assets. That implies that debt represents raw material and not only funding source. And even if it was possible to distinguish between debt and deposits precisely, there is another dimension on which banks differ from other firms. They tend to use more debt in

[38] MASARI, Mario, Gianfranco GIANFRATE a Laura ZANETTI. The valuation of financial companies: tools and techniques to value banks, insurance companies, and other financial institutions. Wiley: Wiley, 2014. ISBN 9781118617335, page 87

funding their business, which once again implies higher financial leverage. Then, even very small changes in the value of assets make big swings in the equity value.

Similar difference regards the working capital and capital expenditures (Capex). The latter is very straightforward for a manufacturing company. It must invest in property, plant and equipment to be able to produce higher volumes. However, banks invest primarily in intangible assets such as customer relationships, brand name or human capital. Consequently, their investments for future growth are recognized as operating expenses, even though they should be treated as investments and capitalized. That would be, however, extremely complicated and for an external analyst almost impossible to do without making large amount of crucial assumptions.

Working capital is normally calculated as current assets minus current liabilities. However, banks create value by transforming liquidity of assets, which means they tend to have high current liabilities and high non-current assets. One is not able to estimate cash-flows without knowing the amount that must be reinvested in order to maintain the current state[39].

Due to all the issues stated above, banks do not have clearly defined cash-flows to firm. For that reason, in order to value a bank, one should utilize different approaches.

- **Regulatory framework**

Regulation plays a large role in a bank valuation. Since financial services firms are much more complex than usual companies, analysts depend on regulatory agencies to prevent banks from taking excessive risks. Banks are required to comply with specific rules, which may prohibit shareholders to take actions, which would otherwise be taken for granted. One also has to take into account different regulatory environment when comparing banks operating in different countries.

2.3 Valuation Models

As the author noted earlier in the thesis, financial services firms do not have clearly defined debt, working capital and capital expenditures. As a result, traditional FCFF and FCFE models may be hardly used directly. However, dividend discount model may be employed, under the assumption that all the free cash-flow to equity is distributed over time as dividends[40]. The residual income model, which puts an emphasis on excess returns rather than on dividends, may also be used. The effortless approach is a relative valuation, which does not require many assumptions and is usually highly volatile, but also adds value to the valuation process. All three approaches will be theoretically

[39] Valuing Financial Service Firms. *NYU Stern* [online]. 2009 [cit. 2017-02-19]. Available at http://people.stern.nyu.edu/adamodar/pdfiles/papers/finfirm09.pdf, page 9

[40] Valuing Financial Service Firms. *NYU Stern* [online]. 2009 [cit. 2017-02-19]. Available at http://people.stern.nyu.edu/adamodar/pdfiles/papers/finfirm09.pdf , page 14

described in the following chapter and ultimately used in order to value Well Fargo & Co. The last commonly known approach except income approaches and relative valuation is the asset based approach. It values the existing assets of the company, subtract its debt and other outstanding claims and report the difference as the implied value of equity. There are, however, several issues associated with the method. Firstly, it is exceptionally difficult to value all the assets of sizeable, multidivisional financial corporation as Wells Fargo. Secondly, the asset backed approach does not take into account growth of the company and excess returns. For these reasons, the method will not be used.

- **Dividend Discount Model**

  Dividend discount model (DDM) estimates the value of a stock using the present value of expected dividends. It is one of the most widely used models; since it allows overcoming the difficulties analysts face in estimating cash-flows when valuing financial services firms[41]. The model assumes indefinite life of a publicly traded company and indefinite ownership of the stock. Value per share is calculated by discounting the expected dividend payments in the respective years. The discount rate is represented by the cost of equity, since dividend is a cash-flow paid directly to the shareholders. The Equation 1 shows the most basic form of the model.

  Equation 2.1: Dividend discount model

$$Value\ per\ share = \sum_{t=1}^{t=\infty} \frac{DPS_t}{(1+k_e)^t}$$

  Where DPS_t is the expected common dividend per share in the time period t,
  k_e is the cost of equity.

  Another simple form of the DDM is represented by the Gordon growth model. It assumes the expected dividend growth rate to be constant forever[42]. The growth rate in the model is expressed by the letter g[43].

  Equation 2.2: Gordon growth model

$$Value\ per\ share = \frac{DPS_1}{(k_e - g)}$$

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41 Valuing Financial Service Firms. *NYU Stern* [online]. 2009 [cit. 2017-02-19]. Available at http://people.stern.nyu.edu/adamodar/pdfiles/papers/finfirm09.pdf, page 15

42 The Stable Growth DDM: Gordon Growth Model. *NYU Stern* [online]. 2006 [cit. 2017-02-19]. Available at http://people.stern.nyu.edu/adamodar/pdfiles/ddm.pdf

43 JÍLEK, Josef. Akciové trhy a investování. Praha: Grada, 2009. Finanční trhy a instituce. ISBN 9788024729633. page 99

The real-life valuation is usually more complicated. The Gordon growth model does not enable analysts to include varying assumptions about the short and long-term periods. For that reason, two-stage, three stage or different forms of the DDM are usually used. In any case, the basic concept remains the same.

There are three sets of assumptions incorporated in the model. The cost of equity (CoE) will be described in the next chapter, since this variable has been subjected to a longstanding controversy. Moreover, the cost of equity should vary in the different time periods and should reflect the opportunity cost of the investor or potentially the risk associated with the investment. The other two assumptions are closely connected to each other. The dividends per share depend on the payout ratio and the net income. Growth rate expresses the growth of the dividends. If one assumes the stable payout ratio, which is the case for the terminal value calculation, the growth rate of the dividends and net income is the same. The growth rate in question is called the sustainable growth rate and might be calculated using the payout ratio and the return on equity, which represents an ultimate profitability metric.

Equation 2.3: Sustainable growth rate

$$Sustainable\ growth\ rate = RoE_{LT} * (1 - PR_{LT})$$

Where RoE_{LT} is the long-term return on equity,
PR_{LT} is the long-term payout ratio[44].

The company has only three basic options when deciding what to do with the retained earnings. The funds may be distributed to shareholders in the form of dividends or share buybacks or utilized for growth either in the form of reinvestments or acquisitions. Naturally, the management can also simply hoard the money and do not employ it at all. In any case, the higher portion of the net income is distributed to shareholders, the less money is available for growth. As a matter of course, if the profitability (RoE) of the company is higher, it is possible to distribute higher dividends and do not sacrifice growth or vice versa. Usually, it is also crucial to observe carefully the relationship between the net income and free cash flow, which the company actually has at its disposal. However, the concept is hardly applied when valuing a financial services firm due to the reasons described above.

The key variable in the dividend discount model is therefore profitability expressed as return on equity. The CoE is measured as an opportunity cost of an investor. It is recommended that if the company has higher RoE than CoE of an average shareholder, it should reinvest the funds. Conversely, if the company's RoE is lower than CoE of an average shareholder, the funds could be invested elsewhere with a higher profitability and consequently higher value

[44] How to Calculate the Sustainable-Growth Rate. *Morningstar* [online]. 2012 [cit. 2017-02-19]. Available at http://news.morningstar.com/classroom2/course.asp?docId=3071&page=2

creation. Even though that at a first glance DDM is driven by dividends per share, at its core it depends on the profitability of the company and on the relationship between its RoE and CoE. Dividend discount model is closely related to the residual income model, which is driven directly by the relationship between return on equity and cost of equity.

- **Residual Income Model**

Another approach of valuing financial services firms is to use the residual income model. The value of a company is calculated as a sum of capital currently invested in the company and the present value of expected excess returns. There are two main inputs needed to value an enterprise using the excess return model. The currently invested capital is usually measured as a book value of equity reported by the firm. Even though the book value is an accounting measure, it should be much more reliable in case of WFC than in case of a manufacturing firm. The assets of financial services firm are usually financial assets, which are marked to market. In addition, there are almost no arbitrary differences caused by the inventory valuation methods or depreciation methods. In essence, depreciation is often negligible for a financial services firm. However, equity capital invested in the firm may be understated in case of share buybacks or one-time charges.

Residual income model is based on the discounting of the expected excess returns. Excess returns are created when the equity charge is lower than the net income[45], in other words, when RoE is higher than CoE. The sum of the current book value and the present value of all expected excess returns results in a formula for the residual income model. The model is based on the same principle as the dividend discount model and therefore the implied equity value should not differ dramatically.

Equation 2.4: Residual income model

$$Value\ per\ share = B_0 + \sum_{t=1}^{t=\infty} \frac{RI_t}{(1+k_e)^t}$$

Where B_0 is the current book value of the firm,
RI_t is the residual income[46].

The residual income model simply discounts an economic profit instead of an accounting net income. That brings investors back to the basic concept of valuation. In order to generate value, companies have to have return on equity higher than the opportunity cost of investors' capital.

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[45] *CFA Institute* [online]. 2010 [cit. 2017-02-19]. Available at https://www.cfainstitute.org/learning/products/publications/Pages/index.aspx

[46] Residual Income Valuation (RIV). *Ready Ratios* [online]. 2014 [cit. 2017-02-21]. Available at https://www.readyratios.com/reference/appraisal/residual_income_valuation_riv.html

- **Relative Valuation**

Multiples used to value financial services firms differ from those traditionally utilized for valuation of manufacturing companies. Since the EV, EBIT, EBITDA or even sales cannot be directly and easily estimated, it is not appropriate to use them for valuation. The most widely applied multiples are therefore price-to-earnings multiple and price-to-book multiple.

Price-to-earnings ratio (P/E) measures the relationship between the current price of the stock and company's earnings per share. It can be calculated using the following formula.

Equation 2.5: Price to earnings ratio

$$Price\ to\ earnings\ ratio = \frac{Price\ \ per\ share}{Earnings\ per\ share}$$

There are three variables, which influence the ultimate value of the ratio – the expected growth of earnings, the payout ratio and the cost of equity[47]. The higher the payout ratio or the growth rate, the higher the P/E ratio. The opposite correlation applies for the cost of equity.

The ratio states how many dollars investors have to pay for one dollar of earnings. P/E ratio is used very frequently, but must be applied with careful consideration of its disadvantages. The most prominent one is the inclusion of all extraordinary items, which may distort the analysis. The second matter regards the risk and expected growth. When valuing multidivisional corporations, investors should apply different multiples to different divisions i.e. commercial banking benefits from completely different risk structure and growth than the trading division.

Price-to-book ratio (P/B) measures the relationship between the current price of a stock and the book value per share. The standard computation is described by the formula below[48].

Equation 2.6: Price to book ratio

$$Price\ to\ book\ ratio = \frac{Price\ \ per\ share}{Book\ value\ per\ share}$$

P/B ratio is impacted by four variables. Ceteris paribus, the higher growth rate, the higher return on equity, the higher payout ratio or the lower cost of equity should result in a higher P/B ratio[49]. Financial services firms are often valued using the P/B ratio due to the strong relationship between the market value of equity and the book value of equity, which is mainly a consequence of marked to market accounting method of banks' asset.

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47 What Determines Price-Earnings Ratios. *EFinance* [online]. 1978 [cit. 2017-02-21]. Available at http://efinance.org.cn/cn/fm/What%20Determines%20Price-Earnings%20Ratios.pdf

48 Overview: Making sense of the price-to-book value ratio. *Market Realist* [online]. 2014 [cit. 2017-02-21]. Available at http://marketrealist.com/2014/08/overview-making-sense-price-book-value-ratio/

49 Price-Book Value Ratio: Definition. *NYU Stern* [online]. 2012 [cit. 2017-02-21]. Available at http://people.stern.nyu.edu/adamodar/pdfiles/eqnotes/pbv.pdf

2.4 The Cost of Equity

If there is one criterion, which influences the final estimated value the most, it is certainly the cost of equity. There are hundreds of papers discussing what discount rate should be used by investors[50]. The most widely utilized philosophy is the one built on the efficient markets hypothesis[51]. The theory denies the very existence of mispriced securities, which contradicts the main concept of the fundamental analysis.

All the valuation models described earlier directly or indirectly depend on the cost of equity. For that reason, even the ultimate value of Wells Fargo is largely dependent on the metric. That said; an investor's competitive advantage should not consist only in the employment of a different cost of equity. The crucial part is the understanding of a business model. In any case, two methods of calculating the cost of equity are used in order to ensure the sanity of the assumptions and provide an investor with a different point of view.

2.4.1 Definition of Risk

The most relevant question regarding the calculation of the cost of equity is how investors define risk. Fama defines risk as volatility. Other investors define risk as a permanent capital loss. The author believes that investors with a long-term investment horizon should give much higher importance to a risk of a permanent capital loss than to volatility. Volatility creates the opportunities, since thanks to volatility the market price oscillates around the intrinsic value. In the long-term, however, the market price closely tracks the intrinsic value. Therefore, it is more important to analyse business model of a company and risks connected to the business model than to focus purely on volatility, which is influenced by emotions.

Warren Buffett and other value investors believe that there is no short-term investing[52]. One can participate in trading as a trader or speculator, however, investors have always long-term investment horizon. Markets are influenced by irrational exuberance in the short-term, which is almost impossible to understand and predict. That is also the reason, why there is no reliable, long withstanding market timing strategy. In the short-term, markets seem not to be efficient and are influenced by emotions, which create volatility and are very difficult to predict.

Moreover, stock prices will always be far more volatile than cash-equivalent holdings. Over the long-term, however, currency-denominated investments have been riskier[53]. During the 1967-2016 period index S&P 500 rose from 84 to 2 275, which with reinvested dividends and adjustment for inflation

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[50] JORDAN, Bradford D., Thomas W. MILLER a Steven D. DOLVIN. Fundamentals of investments: valuation and management. 6th ed. New York: McGraw-Hill Irwin, c2012. McGraw-Hill/Irwin series in finance, insurance, and real estate. ISBN 0073530719, page

[51] PINTO, Jerald E. Equity asset valuation. 2nd ed. Hoboken, N.J.: Wiley, c2010. ISBN 9780470571439, page 45

[52] This Is Warren Buffett's Top Investment Rule. *Time* [online]. 2016 [cit. 2017-02-21]. Available at http://time.com/4286850/warren-buffetts-ground-rules/

[53] Buffett explains why volatility is not risk and why equity is best. *Value Research* [online]. 2016 [cit. 2017-02-21]. Available at https://www.valueresearchonline.com/story/h2_storyview.asp?str=27349&utm_medium=vro.in

generated the overall total real return of astonishing 1,740%[54]. At the same time, the purchasing power of a dollar declined by 87%[55]. The same conclusion may be reached if one takes a look at different time frames. Naturally, they must be long enough in order to have an informative value. Volatility may be an appropriate proxy for risk for traders, speculators and all the market participants with the short-term investment horizon. For a buy-and-hold investor it is, however, completely wrong concept. Most long-term investors do not fear volatility at its core, but they are afraid of a permanent loss of the invested capital[56] or unexploited opportunities. The high volatility requires incredibly firm faith in one's investment strategy. The only risk of volatility for an investor with a long investment horizon lies in a possibility of abandoning the strategy, succumbing to the market and selling at the wrong time.

The capital assets pricing model, multi-factor models and in the end also a build-up approach incorporate risk into the cost of equity. The approach the author describes in this chapter is based on the **opportunity cost** and does not incorporate risk profile of the investment into the cost of equity. On the contrary, the risk is left to be absorbed by the margin of safety. The approach has its own shortcomings and does not solve the core problem consisting in quantification of the risk, but it may provide investors with another useful view on the investments. Especially, when "traditional" and opportunity cost approach are used at the same time. The potential inconsistency may reveal either a distortion in the financial model or an investment opportunity.

According to the theory, the discount rate should be equal to the investor's opportunity cost, in other words, to the return on his second-best investment. The definition of the second-best investment varies across financiers, but for the great number of them it is a widely diversified index e.g. S&P 500 or MSCI World Index. The opportunity cost, as defined by the author, is the total return on the widely diversified index, which is foregone due to selection of another investment. The expected total return on the market has to be estimated and approximated, since the future total return is by definition unknown. The similar concept holds true for the capital asset pricing model. Interestingly, beta of the market (S&P 500) is by definition equal to one. Hence, when calculating required rate of return on the index, it is equal to the expected market return even when using the CAPM model. The main difference of the approaches consists in the inclusion/exclusion of risk in the cost of equity.

The expected total return on an index may be surprisingly easier to estimate than the expected total return on a single investment. The author has decided to proceed with the analysis using the S&P 500 as the index is widely diversified and offers extensive datasets. The model also assumes the 5-year long transition period and a stable growth thereafter.

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[54] Compound Annual Growth Rate (Annualized Return). *Money Chimp* [online]. 2014 [cit. 2017-02-21]. Available at http://www.moneychimp.com/features/market_cagr.htm

[55] Consumer Price Index. *FRED Economic Data* [online]. 2016 [cit. 2017-02-21]. Available at https://fred.stlouisfed.org/series/CUUR0000SA0R#0

[56] Never confuse risk and volatility. *Reuters* [online]. 2014 [cit. 2017-02-21]. Available at http://www.reuters.com/article/us-saft-on-wealth-idUSKBN0H52AL20140910

2.4.2 Opportunity Cost & Expected Market Return

Even though the stock market may be oftentimes highly volatile, its total return is defined by only two variables - fundamental return and emotional return. The former one reflects the fundamentals and the latter shows the value of the companies' earnings to investors.

Equation 2.7: Total return calculation

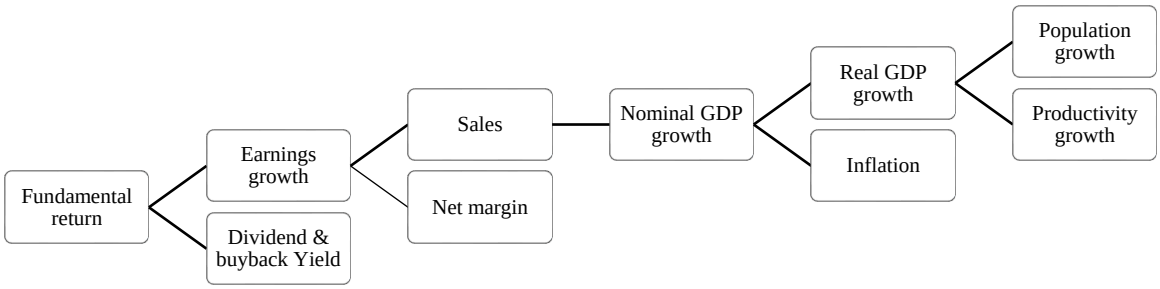
$$Total\ return = Fundamental\ return + Emotional\ return$$

The **fundamental return** is determined by the earnings growth, dividend growth and buyback yield. Moreover, there are several very important drivers, which drive the earnings growth. The drivers are shown in a graphical form at the Figure 2.1.

All these variables must be estimated in order to approximate the expected fundamental return on S&P 500. The index is widely regarded as the best single gauge of the large-cap U.S. equities. It includes 500 leading companies across all the sectors and captures approximately 80% of the available market capitalization in the United States. For that reason, the estimates, especially the population and productivity growth, regard the local economy. S&P 500 is also one of the best single indices which represent a proxy for the market used by many analysts all over the world[57].

Currently, investors have a possibility to buy an exchange-traded fund tracking the index S&P 500 very inexpensively. The net expense ratio of the exchange traded fund SPDR S&P 500 is only 0.0945%. For the sake of simplicity, these costs will not be taken into account. Besides, they would make only marginal difference. In any case, this ETF is in this paper considered to represent the opportunity cost.

Figure 2.1: Fundamental return drivers



Source: Financial Physics

[57] SIEGEL, Jeremy J. Investice do akcií: běh na dlouhou trať. Praha: Grada, 2011. Finance (Grada). ISBN 9788024738604, page 53

Table 2.1: Real GDP drivers

Year	Population growth	Productivity growth
1997	1.21%	1.6%
1998	1.18%	3.1%
1999	1.15%	3.4%
2000	1.12%	3.4%
2001	0.99%	3.0%
2002	0.93%	4.3%
2003	0.86%	3.5%
2004	0.93%	3.0%
2005	0.93%	1.9%
2006	0.97%	0.9%
2007	0.96%	1.7%
2008	0.95%	0.8%
2009	0.88%	3.4%
2010	0.44%	3.2%
2011	0.78%	0.1%
2012	0.76%	0.8%
2013	0.74%	-0.1%
2014	0.79%	0.7%
2015	0.80%	0.6%

Source: Shiller's data, FRED Economic Data

The elementary drivers of the earnings growth are the population and productivity growth rates. Naturally, the higher these variables are, the higher is the earnings growth. The productivity and population growth, which consequently drive the real GDP, are expected to be slightly lower than in the past. The annual population growth has been gradually decreasing[58] and is assumed to average at the 0.5% rate in the future. The transition period takes into account the population growth of 0.7%. In the beginning of the millennium the productivity growth exceeded 3% per year. However, the average for the last 5 years is only 0.4%[59]. The trend of the digitalization, robotization and globalization is expected to continue; however, the productivity should rise slower than in the past decades, when computers were used for the first time in many companies. Therefore, the terminal productivity growth is approximated to 1.2%.

The two variables analysed above result in a real GDP growth of 1.9% in the next five years and 1.7% in the terminal period. As a matter of course, the actual real GDP growth will be different, but the goal of the model is to approximate the average future period. The inflation rate is expected to stay at the FED target of 2%. As a result, the expected nominal GDP growth in the terminal period is 3.7%. The estimate is also supported by the median rate of the nominal GDP growth in the last 10 years of the same value[60].

The aggregate revenues of all the companies in the index are expected to rise by the same rate as the nominal GDP. The S&P 500 is widely diversified index and included companies represent the overall economy very well. In addition, if the sales of companies in the S&P 500 rose less than the nominal GDP, the situation would result in their gradual decline, since other companies would overtake the economy. On the other hand, if their sales grew faster than the nominal GDP, only the companies included in the S&P 500 would eventually operate in the economy. Such an assumption would be flawed even if the effect of the international trade was taken into account.

The last variable, which influences the growth of the earnings, is the profit margin. The metric has been very stable in the recent quarters. Its terminal value has been computed as a median of the

[58] US Population Growth Rate. *Shiller's Data* [online]. 2017 [cit. 2017-02-21]. Available at http://www.multpl.com/us-population-growth-rate

[59] Private Non-Farm Business Sector: Labor Productivity. *FRED Economic Data* [online]. 2017 [cit. 2017-02-21]. Available at https://fred.stlouisfed.org/series/MPU4910063#0

[60] Gross Domestic Product. *FRED Economic Data* [online]. 2017 [cit. 2017-02-21]. Available at https://fred.stlouisfed.org/series/A191RP1A027NBEA

last 40 quarters and totalled to 8.1%[61]. The actual value of the profit margin is for the purpose of the analysis not as important as its year over year change. The current profit margin stands at 8.75%. Its assumed decline over the transition period (using the CAGR) results in a reduction of the earnings growth by 1.5% p.a.

All these drivers consequently lead to a transition-period earnings growth of 2.4% and terminal earnings growth of 3.7%.

The last factor impacting the fundamental return is the dividend and buyback yield. Buybacks, in general, have become very popular in the last two decades. Thus, current analysis must incorporate share repurchases, since they contribute to the total return basically as much as dividends. The benefit of the buybacks is the reduction of a number of shares outstanding virtually increasing the value of the shareholder's claim. The average gross cash yield (dividend + buyback yield) has totalled to 5.26% in the last 10 years[62]. However, this rate is not sustainable in the long-term, since the payout ratio in the last two years has surpassed 100% and even in the years before was exceptionally high. The future sustainable payout ratio may be calculated using the common formula.

Equation 2.8: Payout ratio

$$Payout\ ratio = 1 - \frac{g}{ROE}$$

Where g is the growth rate,
RoE is the terminal return on equity.

The growth rate in the terminal period is equal to the nominal GDP growth rate. The terminal sustainable RoE has been calculated by prof. Damodaran as 13.54%[63]. Thus, the terminal payout ratio is equal to 72.7%. Having the terminal payout ratio and terminal P/E (analysed in the next paragraph) allows the author to compute the terminal dividend and buyback yield, which comes to 3.97%.

The analysis of the fundamental return has been simplified, since the comprehensive study would substantially exceed the scope of the thesis, but the basic concept has been enlightened. After summing all the respective parts, the terminal value of the expected fundamental return comes to 7.67%.

The **emotional return** is considerably more difficult to estimate. It is measured as the change in the valuation multiples such as price to earnings ratio. The metric is significantly impacted by the investors' risk appetite and by their opportunity costs. The recessions are often predicted on the back of high P/E ratios. That logic is, however, flawed, since the ratio cannot be compared only to itself. It

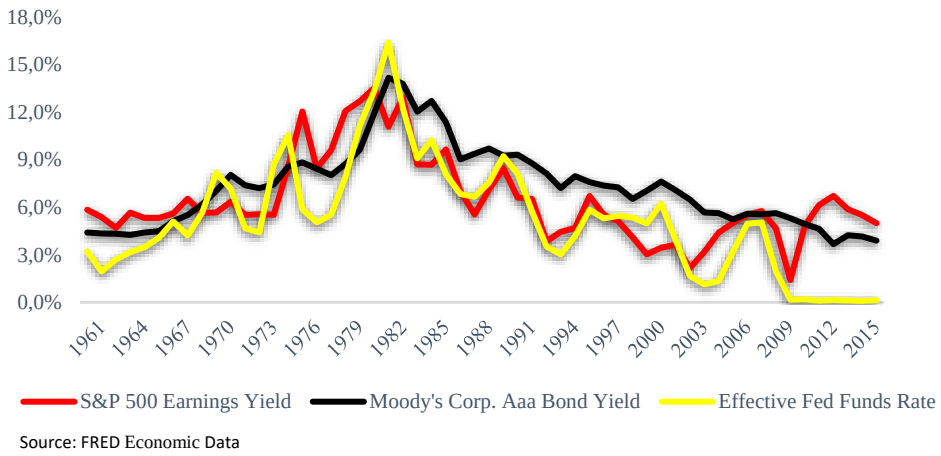
[61] S&P 500. *S&P Dow Jones Indices* [online]. 2017 [cit. 2017-02-21]. Available at http://us.spindices.com/indices/equity/sp-500

[62] ERP. *NYU Stern* [online]. 2017 [cit. 2017-02-21]. Available at http://pages.stern.nyu.edu/~adamodar/

[63] January 2017 Data Update 2: The Resilience of US Equities!. *Musings on Markets* [online]. 2017 [cit. 2017-02-21]. Available at http://aswathdamodaran.blogspot.de/2017/01/january-2017-data-update-2-resilience.html

always has to be associated with other investments. The reciprocal value of the price to earnings ratio is the earnings yield. The FED funds effective rate gradually declined over the years. Therefore, it may not be surprising that bonds' YTM and the earnings yield also dropped. The metrics are closely related, since investors maximize their utility and always consider their opportunity costs.

Figure 2.2: Rates and yields development



Source: FRED Economic Data

Moreover, investors' fear and greed also greatly influence the P/E ratio. However, these states of enthusiasm or desperation cannot be easily predicted. The author approximated terminal P/E ratio using the median P/E of the 2000-2016 period (18.29). The estimate of P/E in the terminal period will probably differ from the actual value the most; however, the effect for a long-term oriented investor is not of a great importance.

In the long run, the fundamental return is almost entirely responsible for the total return delivered in the stock market. As the time period rises, the change in valuation contributes to the total return less and less. Even if P/E ratio contracted from 20 to 15 in the 30 years period, its contribution would be only 1% CAGR. On the other hand, when speculators try to time the market, they are strongly dependent on the emotional return, which may contribute even more than 50% to the total return over the period of 5 years. The shorter the period, the higher is the contribution of the emotional return. When investing only for the period of days or months, speculator's returns are almost entirely dependent on the change of valuation multiple.

Table 2.2: Fundamental and emotional return in different time periods

Time period	Fundamental return	Emotional return
40 years (1962 - 2001)	100%	0%
20 years (1962 - 1981)	72%	28%
20 years (1982 - 2001)	66%	33%
5 years (2001 - 2004)	44%	55%

Source: Financial Physics

The **total return,** as a sum of the fundamental and emotional return analysed in the previous chapters, is equal to 4.4% in the transition period as the profit margin and P/E ratio converge to their stable values and lower the ending value. The terminal expected total return on the S&P 500 index is 7.67%. That is very close to the annualised return of the index in the last 30 years. The total annual return from 1986 to 2016 is 7.61%. The value of the expected future return on S&P 500 represents opportunity cost of the investor studied in the thesis. It will also enter into the valuation as the cost of equity and would not change if different company was analysed, since it does not incorporate risk profile of the investment.

Table 2.3: Calculation of the expected return on S&P 500

	Transition period	Terminal period
Population growth	0,7%	0,5%
Productivity growth	1,2%	1,2%
Real GDP growth	**1,9%**	**1,7%**
Inflation	2,0%	2,0%
Nominal GDP growth	**3,9%**	**3,7%**
Change in sales	3,9%	3,7%
Change in profit margin	-1,5%	0,0%
Earnings growth	**2,4%**	**3,7%**
Dividend & buyback yield	5,3%	4,0%
Fundamental return	**7,6%**	**7,7%**
Change in P/E ratio	-3,2%	0,0%
Emotional return	**-3,2%**	**0,0%**
Expected return	**4,4%**	**7,7%**

Source: Author's calculation

2.4.3 Comparison of the Methods

A majority of the models calculating the cost of equity incorporate risk, which is very difficult to quantify and the process is in practice subjective. It is not an exception that beta factor in CAMP model is hard-coded and reliant on analyst's investment case and experience. There would be no point in analysing a company and accepting the fact that markets are perfectly efficient at the same time. In other words, utilization of the stock's historical beta creates a logical conflict.

The alternative approach is employment of beta factor calculated as an average/median of re-levered betas of comparable companies (in case of financial services firm simply levered betas). This approach represents a compromise between acknowledging market efficiency and existence of mispriced securities. An analyst on the one hand analyses a stock with a hope of discovering an investment opportunity and on the other hand admits that markets are mostly, but not perfectly efficient. The biggest advantage of this approach is its simplicity and standardization. There are models explaining higher portion of diversified portfolio returns such as Fama-French three factor model or Carhart model, which has proven to explain up to 78% of the Swiss stock market returns[64]. However, these

[64] CAPM vs. Multifactor Models: Evidence from Switzerland. *University of Zurich* [online]. 2013 [cit. 2017-02-21]. Available at https://www.merlin.uzh.ch/publication/show/11247

models are not widely used due to their complexity and deep-rooted industry standard. In comparison, the CAPM model explains only 63% of the stock market returns.

Milton Friedman once said that *it takes a model, to beat a model*[65]. The method of calculating the cost of equity described in the previous chapter does not solve the core problem regarding the risk quantification. It only transfers it to the margin of safety, which typically fluctuates between 20% and 50%. Furthermore, the approach does not take into account the time value of money, since the margin of safety is static. However, there is one great advantage of the approach. When using the opportunity cost method, investors implicitly assume the same value of money stemming from different investments. Basically, one dollar generated by one company should have for the investor exactly the same value as one dollar generated by a different company. When using different cost of equity for different investments, that is not the case.

To sum up, the intrinsic value of the investment is highly sensitive to the cost of equity. However, the rate should not reflect all the investor's fears and hopes. The main focus should be on the expected cash-flows and the business risk[66]. Nonetheless, investors, who use standardized approach and the opportunity cost method, may gain crucial insight into the valuation.

This chapter concludes the theoretical part of the thesis. The described framework is further elaborated in the following chapters using the company specific fundamentals. As a matter of course, ultimate valuation is executed utilizing both approaches of cost of equity calculation.

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[65] Myth 4.1: If you don't like betas (or modern portfolio theory),you cannot do a DCF!. *ValueWalk* [online]. 2016 [cit. 2017-02-21]. Available at http://www.valuewalk.com/2016/11/myth-4-1-dont-like-betas-modern-portfolio-theoryyou-cannot-dcf/2/

[66] January 2017 Data Update 6: A Cost of Capital Update!. *Musings on Markets* [online]. 2017 [cit. 2017-02-21]. Available at http://aswathdamodaran.blogspot.de/2017/01/january-2017-data-update-6-cost-of.html

3 FUNDAMENTAL ANALYSIS OF WELLS FARGO & CO.

The practical part of the thesis is focused on fundamental analysis of Wells Fargo & Company. The author has used the bottom-up approach and therefore has not proceeded with a comprehensive macroeconomic analysis. Nonetheless, banks, in general, are very sensitive to several macroeconomic variables, which therefore cannot be omitted. The major emphasis is given to the company specific issues and individual company valuation.

3.1 United States Banking Industry Analysis

There is no doubt that banks, insurance and leasing companies stand as the cornerstone of the economy. Only finance and insurance form 7.6% of the whole United States economy which is a significant surge in comparison to 2.3% almost 70 years earlier[67]. Banks' activities influence every industry and interest rates, as the price of money, impact daily decisions of millions of people.

Commercial banking is a nominal monetary business. Expected inflation does not disrupt profitability, since the interest rates are adequately elevated. Contrariwise, the unexpected inflation may significantly harm real income of the shareholders. The future development of the industry is greatly dependent on the growth of the economy, interest rates, indebtedness of the economy, market concentration, digitization, financial technologies and other factors.

3.1.1 Impact of the Macroeconomic Factors on the Industry

Banking industry as a whole is greatly dependent on the macroeconomic factors. The operations of banks vary during expansionary and contractionary stages of the business cycle. The correlation between the GDP growth and pre-tax net operating income of banks supervised by FDIC is only 0.12[6869]. The analysis carried out with a one year lag of the income results in a correlation of 0.33. That does not mean, however, that banking industry is not dependent on the economic cycle. Further examination reveals that the operating income is simply far more volatile and reacts disproportionally, but positively on the expansionary phase of the economy. Throughout the expansion, companies increase the scale of their operations using the bank financing. Similarly, consumers are more confident in their future earnings and are more likely to take loans. On the other hand, during the contraction, companies usually focus on cost-cutting and reduce their capital expenditures, which result in a lower demand for loans. Likewise, the unemployment rises and people are less likely to repay their loans and mortgages. Therefore, the amount of provisions for credit losses and write-offs rise and banks' profits diminish as a result. However, except the extraordinary deep-rooted financial crisis as the world experienced in 2008, banks are usually well prepared for the contractionary phase.

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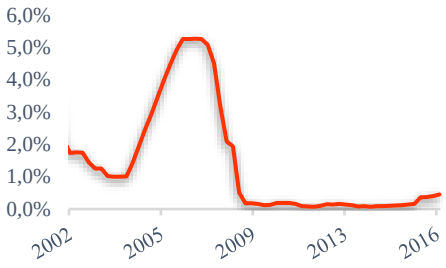
[67] Banking Industry Data. *Bureau of Economic Analysis* [online]. 2017 [cit. 2017-03-01]. Available at: https://www.bea.gov/iTable/iTable.cfm?ReqID=51&step=1#reqid=51&step=51&isuri=1&5114=q&5102=15

[68] Gross Domestic Product. *FRED Economic Data* [online]. 2017 [cit. 2017-03-01]. Available at: https://fred.stlouisfed.org/series/GDP

[69] Commercial Bank Reports. *FDIC* [online]. 2017 [cit. 2017-03-01]. Available at: https://www5.fdic.gov/hsob/HSOBRpt.asp

It is important to note, that it is very difficult to predict a recession and incorporate the findings into the financial model. All these assumptions have to be made by an analyst and it is just another example of the subjectivity of the intrinsic value.

Figure 3.1: Effective federal funds rate



Source: FRED Economic Data

One of the most important drivers of bank's operations is the effective federal funds rate set by FED. The rate basically determines the cost of money. Currently, the interest rates are bottoming out, but it is very improbable that they will rise soon to the pre-crisis levels. The Federal Reserve has undertaken only two rate hikes since 2008 and acts very carefully. FED's balance sheet was growing due to the quantitative easing between August 2007 and August 2014 by 30.4% CAGR[70]. The money base M2 and inflation, however, stayed at reasonable levels growing by 6.7%[71] and 1.4%[72], respectively. The financial crisis had had very deflationary effects and most of the money FED had printed simply did not penetrate into the system. It remained in the banks' balance sheets and contributed to the rise in the stock market and bond prices. However, the FED has announced future minor rate hikes, which should without any extraordinary events improve banks profitability in the medium and long-term.

3.1.2 Indebtedness of the Economy

Banks and commercial banks in particular are dependent on the amount of debt in the economy. Ceteris paribus, higher debt results in a higher interest earned which consequently drives the income.

The United States are the most indebted country in the world with a national debt approaching $20 trillion or 107% of the GDP[73]. The United States national debt has been accumulating for many decades and has never been fully repaid. Nonetheless, as long as the investors' faith is stable, the debt may soar. The major portion of the burden is represented by the federal government debt financed by the treasury bonds and notes. However, these securities are considered as risk-free, which consequently mean that lenders are compensated only for liquidity, inflation and other minor inconveniences. American banks hold less than 3% of the U.S. national debt, namely $570 billion[74].

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[70] Credit and Liquidity Programs and the Balance Sheet. *Federal Reserve System* [online]. 2017 [cit. 2017-03-01]. Available at: https://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm

[71] M2 Money Stock. *FRED Economic Data* [online]. 2017 [cit. 2017-03-01]. Available at: https://fred.stlouisfed.org/series/M2#0

[72] Consumer Price Index for All Urban Consumers: All Items. *FRED Economic Data* [online]. 2017 [cit. 2017-03-01]. Available at: https://fred.stlouisfed.org/series/CPIAUCSL

[73] National Debt of United States. *National Debt Clocks* [online]. 2017 [cit. 2017-03-08]. Available at: http://www.nationaldebtclocks.org/debtclock/unitedstates

[74] Who Owns the U.S. National Debt? *The Balance* [online]. 2017 [cit. 2017-03-08]. Available at: https://www.thebalance.com/who-owns-the-u-s-national-debt-3306124

The main profit generating operations stem from the issuances of the private debt (mortgages, student loans, credit cards, commercial loans etc.). Private debt is the money owed by individuals, households, businesses and all other subjects other than governments or public entities. The ratio of private debt to GDP for the United States economy stands at outstanding 189%. That is even above the values reported by Japan (183%), UK (134%) or Germany (78%)[75] and significantly above the US national debt to GDP ratio. The private debt to GDP ratio has declined after the financial crisis driven especially by the reduction of outstanding mortgages. The metric is still extraordinary high in comparison to its historical levels. However, the value is lifted mainly by the debt of businesses, which does not have to be necessarily inappropriate in the current environment of the low interest rates.

Figure 3.2: Indebtedness of the United States

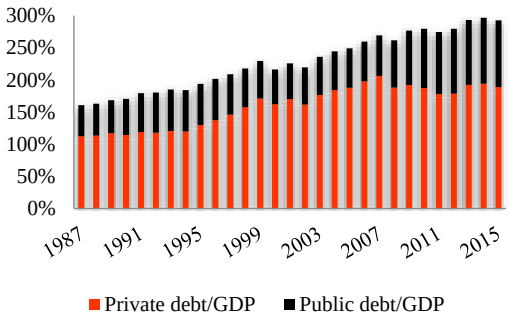
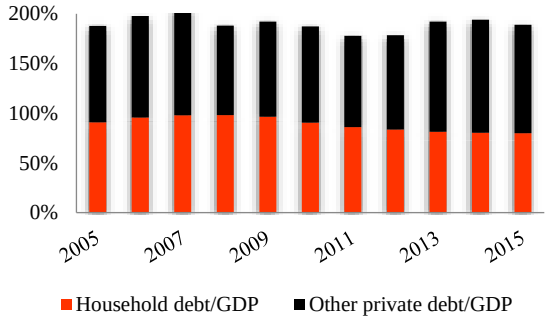


Figure 3.3: Composition of the U.S. private debt



Source: FRED Economic Data, World Bank

The household debt, in particular, represents 80% of the GDP[76]. An average American owed in 2015 $45 000[77] in household debt corresponding to 112% of the net household disposable income. The United States are doing very well in this statistic considering the UK household's having debt equal to 150% of their net disposable income. The situation is even worse for other OECD members such as Denmark (292%), Netherlands (277%) or Australia (212%)[78]. In this context, there is still a possibility of a slight upturn in the consumer loan book volumes. On the other hand, commercial loan book volumes are expected to diminish as the interest rates rise and debt becomes more expensive.

[75] *FRED Economic Data* [online]. 2017 [cit. 2017-03-08]. Available at: https://fred.stlouisfed.org/

[76] Household Debt to GDP for United States. FRED Economic Data [online]. 2017 [cit. 2017-03-08]. Available at: https://fred.stlouisfed.org/series/HDTGPDUSQ163N#0

[77] U.S. Population. *World of Meters* [online]. 2017 [cit. 2017-03-08]. Available at: http://www.worldometers.info/world-population/us-population/

[78] Household debt. *OECD Data* [online]. 2017 [cit. 2017-03-08]. Available at: https://data.oecd.org/hha/household-debt.htm

3.1.3 Market Concentration

Market concentration measures the extent of domination of sales by one or more firms in a particular market[79]. The historical trend in the United States banking industry has been very favourable for giant banks. Despite current general awareness that financial institutions should be reduced in size or divided, since their complexity threatens the stability of the financial system, Top 100 commercial banks in the United States manage almost 80% of total loans. In 1985, it was only 51%. The 4 biggest commercial banks' market share based on total loans and leases is almost 40%. Today WFC alone controls basically the same percentage of assets the entire top five biggest banks did in 1990[80]. These statistics underline the consolidation of the industry in the 1990s and the actual current importance of the huge financial corporations.

Figure 3.4: Share of top 100 banks on loans

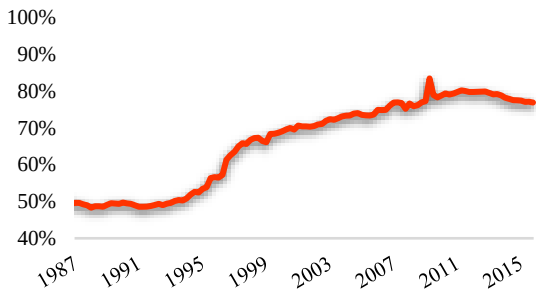
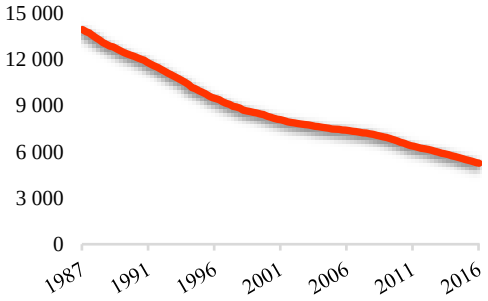


Figure 3.5: Commercial banks in the US



Source: FRED Economic Data

The further consolidation of the industry likely won't be driven by the financial conglomerates. The Federal Reserve has established rules taking effect in 2015 that prohibit mergers, which would create an institution having more than 10% of industry's total liabilities[81]. The promises of politicians and regulators given during the financial crisis were thus at least partially fulfilled. Nevertheless, mergers between medium and small-size banks are still expected, which will drive the absolute amount of the commercial banks in the United States downwards. The further consolidation is mainly a result of higher regulatory requirements, compliance expenses and high competitive pressure in the environment of the low interest rates. Furthermore, small and regional banks incur high costs related to a software development and technology advancement. The general trend forces banks to benefit from the economies of scale and reduce personnel cost as the direct communication with customers becomes increasingly less important.

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[79] Definition of 'Market Concentration'. *The Economic Times* [online]. 2017 [cit. 2017-03-01]. Available at: http://economictimes.indiatimes.com/definition/market-concentration

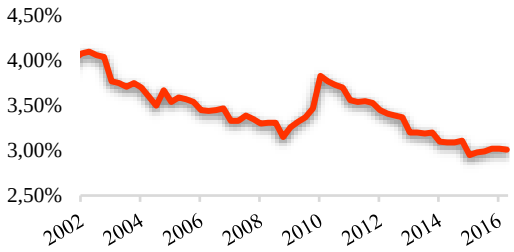
[80] Five Biggest U.S. Banks Control Nearly Half Industry's $15 Trillion In Assets. *Forbes* [online]. 2014 [cit. 2017-03-01]. Available at: http://www.forbes.com/sites/steveschaefer/2014/12/03/five-biggest-banks-trillion-jpmorgan-citi-bankamerica/#1908058d1d43

[81] Fed Issues Tighter Restrictions on Financial Institution Acquisitions. *Practical Law* [online]. 2014 [cit. 2017-03-01]. Available at: http://us.practicallaw.com/2-567-9409?source=relatedcontent

3.1.4 Profitability of the Industry

The profitability of the United States banking industry has many determinants. Firstly, it is clearly a mature industry with a 200-years long history[82], which generates fairly stable profits. Secondly, the profitability is closely related to the prevailing interest rates set by the Federal Reserve. Since the effective federal funds rate has been oscillating around zero percent in the last 7 years, banks' profitability has been significantly harmed.

Figure 3.6: Net Interest Margin for U.S. Banks

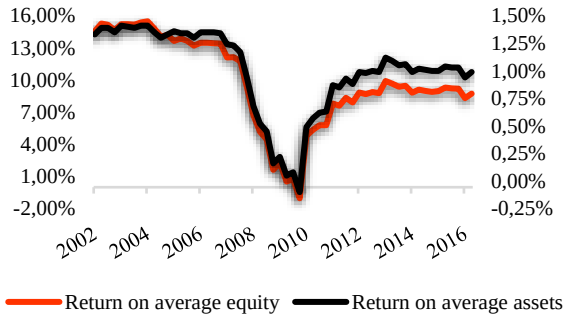


Source: FRED Economic Data

Net interest margin of all U.S. banks sharply decreased and only the interest rate hike in 2015 was able to slightly alternate the trend. The zero-interest rate environment strengthened the competitive pressure and consequently drove the NIM down. Since NIM is one of the main determinants of the commercial banks' profits, their profitability decreased. However, interest rates are expected to rise in the future as FED announces interest rate hikes, hence the NIM should widen and the profitability should significantly improve.

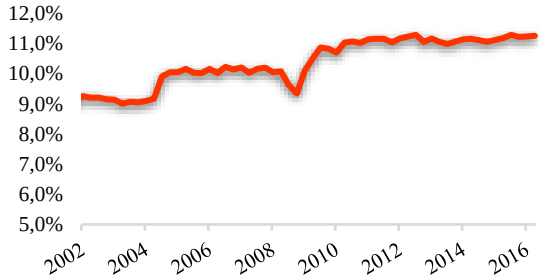
Naturally, there are many other drivers of banks' profits such as regulatory requirements, economic growth or the extent of the risk undergone. The last financial crisis exposed significant flaws in the former regulation of the financial institutions. Risks of financial derivatives were not assessed correctly, which consequently led to the worst depression since 1930s. Dodd-Frank Act and BASEL III established stricter rules and increased capital requirements, which banks have to comply with. That resulted in a generally lower leverage and higher proportion of total equity to total assets.

Figure 3.7: Profitability of banks in the US



Source: FRED Economic Data

Figure 3.8: Equity to assets for U.S. banks



However, the stricter regulation banned or restricted risky operations, which were in normal times highly profitable. Furthermore, the higher proportion of equity resulted in a reduced profitability due

[82] BANK OF THE UNITED STATES. *History.com* [online]. 2014 [cit. 2017-03-01]. Available at: http://www.history.com/topics/bank-of-the-united-states

to lower leverage and higher base. Considerable changes in the regulation also entail high costs spent on compliance, lawyers, auditors etc. According to WSJ the six largest U.S. banks have spent more than $70 billion in order to integrate new legislation and rules instituted as an aftereffect of the financial crisis[83]. Pressure on the net interest margin, stricter regulation, legislation changes and general public distrust had significant impact on banks' profitability in the last 7 years. The industry as a whole found itself on the border between value creation and destruction, since the average cost of equity for U.S. banks is estimated to be around 10%. The return on average equity and return on average assets (RHS) depicted on the Figure 3.7 seem to stabilize on lower levels than before the financial crisis. The golden age of the banking industry (including high bonuses for executives and senior managers) has probably come to an end.

That however does not mean that banks report losses. The bank industry has been growing in size and in 2015 reported record high profits despite record low yields[84]. Banks have alternated their business models, cut expenses and focused on volumes.

3.1.5 Porter's Five Forces Analysis

An industry may be very well analysed using the five forces defined by Michael Porter - the power of suppliers, power of customers, threat of entry, threat of substitutes and rivalry among existing competitors[85].

The banking industry is specific by the different concept of the value creation. The difference between cash, financial investments, inventory or working capital in general is vague. All of these categories are represented by cash or different financial instruments. In any case, banks do not create value by transforming raw material or resources into final product. They create value by transforming liquidity and risk, providing customers with convenient way of managing their money, providing advisory services etc. For that reason, the **threat of substitutes** is extremely high in the industry. Generally, meaningful differentiation is very difficult, if not impossible, to achieve in the industry.

In essence, money is considered the most liquid instrument, which is perfectly transferable. If a customer takes a loan, the product, loan itself, is almost the same whatever bank provides it. Customer receives a certain amount of money, which he is obliged to repay. The most important variable is the interest rate. Potentially, other factors as proximity of the branch office or historical relationship with the bank may be considered. However, customers almost always feel and think that they a choice. Thus, differentiation in the industry is exceptionally challenging. That is the direct opposite of Apple, Coca-Cola or Tesla. The brand recognition is one of the few ways, which may create a feeling of

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[83] The Cost of New Banking Regulation: $70.2 Billion. *Wall Street Journal* [online]. 2014 [cit. 2017-03-01]. Available at: http://blogs.wsj.com/moneybeat/2014/07/30/the-cost-of-new-banking-regulation-70-2-billion/

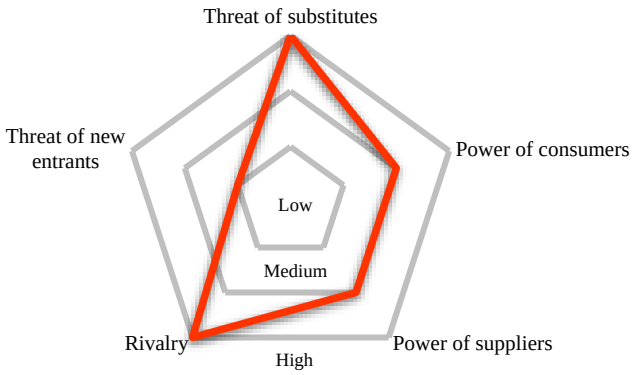
[84] Bank industry profits hit record high in 2015, despite record low in loan yields. *SNL* [online]. 2016 [cit. 2017-03-01]. Available at: https://www.snl.com/InteractiveX/Article.aspx?cdid=A-35305482-11317

[85] PORTER, Michael E. The Five Competitive Forces That Shape Strategy. Harvard Business Review [online]. 2008, 86(1), 78-93 [cit. 2017-01-28]. ISSN 00178012.

coveted brand loyalty, but the threat of substitutes will always loom in the sector. Well Fargo invested in fiscal year 2015 more than $606 million into advertising and promotion[86]. Its competitors JPMorgan and BoAML spent on marketing $2.7 and $1.8 billion[87], respectively[88]. The threat of substitutes was intensified when companies outside the industry started to provide services traditionally available only from banks i.e. PayPal, Apple Pay, blockchain etc.

The rise of the internet substantially improved the **bargaining power of customers**. The amount of time necessary for switching a bank has been limited and customers may quickly compare banks' terms and conditions. An individual does not pose much risk for a bank. However, retail clients as a class hold substantial bargaining power, since NII is usually for commercial banks the most important revenue item. Corporate and high net worth individuals have relatively greater individual bargaining power, since the loss of sizable accounts may have higher impact on the bank's profitability. The latter is distinctive for the asset management, where the loss of a one well-known customer may launch substantial withdrawals.

Figure 3.9: Porter's five forces analysis



Source: Author's illustration

Bargaining power of suppliers cannot be analysed at once. Banks suppliers are divided into two groups, because they conceptually differ. First group consist of depositors (supplying capital), the second group includes employees (supplying labour). The former group's situation is essentially the same as for the bargaining power of customers. Employees usually do not possess much bargaining power. The participation rate in the labour unions is low and individual suppliers, except executives, have basically no influence over bank's operations and strategy.

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86 Wells Fargo Annual Report 2015. *Wells Fargo* [online]. 2016 [cit. 2017-03-08]. Available at: https://www08.wellsfargomedia.com/assets/pdf/about/investor-relations/annual-reports/2015-annual-report.pdf

87 Bank of America Annual Report 2015. *Bank of America* [online]. 2016 [cit. 2017-03-08]. Available at: http://media.corporate-ir.net/media_files/IROL/71/71595/AR2015.pdf

88 JPMorgan Chase & Co. Annual Report 2015. *JPMorgan Chase & Co.* [online]. 2016 [cit. 2017-03-08]. Available at: https://www.jpmorganchase.com/corporate/investor-relations/document/2015-annualreport.pdf

The banking industry in the United States is considered **highly competitive**. Basically, all the customers, who need banking services, already have them. Therefore, new customers must be lured from the competitors. That is, however, very expensive. Banks try to sell to their customers as many products as they can. There are two reasons for the behaviour. Firstly, more sold products of course mean higher revenue for the bank. Secondly, the more products a customer have, the higher his switching costs are and the less likely he is to embrace competitor's offer.

Strict regulation, high capital requirements and significant time to establish brand identity and operations dwarf the **threat of new entrants** to minimum. Financial giants as Wells Fargo or JPMorgan have been having operations for decades. There is a very low probability that any new entrant would seriously threaten their position in less than a decade.

In conclusion, the United States banking industry is highly competitive with only medium power of suppliers or customers. However, the sector as a whole is very specific due to the distinct traits of money. Given the strict regulatory requirements, new entrants have very difficult initial position. The banking industry is indispensable part of the economy and it is very reasonable to expect continuation of its maturity stage. However, economic profits of banks in a developed economy are expected to decrease so is the difference between return on equity and cost of equity.

3.2 Business Model of Wells Fargo & Co.

Analysis of a business model is usually rather qualitative, but helps an analyst to create a general opinion about the business. The further analysis of specific operations is usually executed during the financial modelling when an analyst finalizes assumptions in the form of numbers. In any case, deep understanding of the business is in the current extremely competitive world absolutely crucial.

3.2.1 Business Description

Wells Fargo & Company is an American community-based international banking and financial services holding company with a $1.93 trillion in assets. It was founded in 1852 and currently is headquartered in San Francisco. The company provides banking, insurance, investments, mortgage, and consumer finance through 8,700 branches and 13,000 ATMs. Even though the bank is strongly focused on the United States market, it has offices in 36 countries in order to support its customers, who conduct business worldwide[89]. It is the 3rd biggest bank in the United States and according to Forbes the 7th largest corporation in the world[90]. With approximately 265,000 active, full-time equivalent employees, it serves every third household in the United States.

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[89] Wells Fargo Annual Report 2015. *Wells Fargo* [online]. 2016 [cit. 2017-03-13]. Available at: https://www08.wellsfargomedia.com/assets/pdf/about/investor-relations/annual-reports/2015-annual-report.pdf, page 30

[90] Wells Fargo Today. *Wells Fargo* [online]. 2017 [cit. 2017-03-13]. Available at: https://www08.wellsfargomedia.com/assets/pdf/about/corporate/wells-fargo-today.pdf

Wells Fargo is believed to be the strongest bank in the United States. Company's business model is based on the three pillars, which include diversified loan portfolio, diversified non-interest income and prudent risk management. The proportion of consumer to commercial loans in the bank's portfolio is almost 50:50. Furthermore, the broad footprint enables the bank to diversify geographically and also within different segments of the economy. The composition of the non-interest income also reflects the concept of diversification as the most appropriate protection against risk. The pragmatic risk management positioned bank into community banking with low exposure to global events, investment banking and trading[91]. Therefore, the stock shows less volatility and was widely considered as a safe harbour among investors.

The bank operates through three segments – community banking, wholesale banking and wealth and investment management (WIM).

- **Community Banking**

  Community banking offers a complete line of diversified financial products and services for consumers and small businesses including checking and savings accounts, credit and debit cards, and auto, student, and small business lending. These products also include investment, insurance, trust services and mortgages and home equity loans.

  The segment's total revenue exceeded $48.8 billion in 2016 with a bias to the net interest income, which formed approximately 60% of the total revenue. The non-interest income forms 40% with mortgage and card fees making up almost half of the amount. The bank's strongest segment contributed with 57% to the consolidated net income in 2016.

- **Wholesale Banking**

  Wholesale banking provides financial solutions to businesses across the United States and globally. WFC is able to offer complete line of products to business, which strengthens its position and cross-selling revenues. The wholesale banking incorporates treasury management, credit services, risk management, investments such as 401(k), institutional brokerage, investment management, insurance services, capital markets & advisory, trust servicing and international business services.

  Total revenue of the segment amounted to $28.5 billion in 2016, while the net interest income formed 56% of the amount. Wholesale banking contributed with 38% to the consolidated net income.

[91] Wells Fargo Benefits from a Solid Business Model. *Market Realist* [online]. 2016 [cit. 2017-03-13]. Available at: http://marketrealist.com/2016/06/wells-fargo-benefits-solid-business-model/

- **Wealth and Investment Management**

  Wealth and investment management provides a full range of personalized wealth management, investment and retirement products and services to clients across the United States. The bank delivers financial planning, private banking, credit, investment management and fiduciary services to high-net worth and ultra-high-net worth individuals and families. WFC also serves clients' brokerage needs, supply retirement and trust services to institutional clients and provides investment management capabilities delivered to global institutional clients through separate accounts and the Wells Fargo Funds.

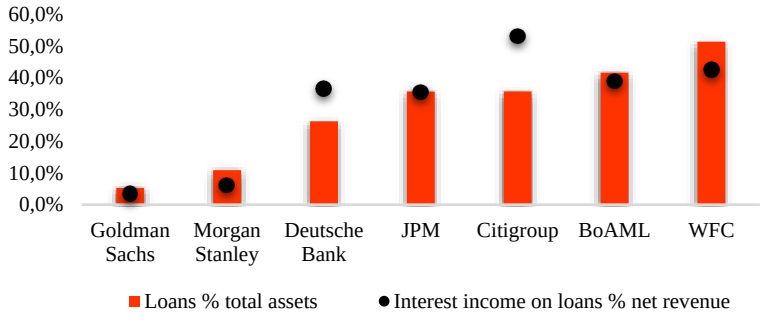
  WIM is in terms of total revenue and net income the smallest segment contributing only with 18% and 11% respectively. However, it greatly completes the product line and allows WFC to satisfy even the most demanding customers with in-house services.

The scope of the thesis does not allow the author to elaborate on the specific business segment further. But it is assumed that an analyst would investigate much more on the core business of the bank when carrying out an analysis for commercial purposes. Nevertheless, even now it is obvious that WFC's performance is indirectly affected by the wide variety of factors influencing the consumers as well as businesses.

3.2.2 Market Share Analysis

For an appropriate market share analysis regarding Wells Fargo, it is necessary to first scrutinize and define the sub-industry the bank operates in. Wells Fargo is a commercial bank of a significant size. The former statement is proved by the Figure 3.10. Since WFC earns high proportion of its revenues from loans and manages high share of loans as a percentage of total assets, it is appropriate to classify it as a commercial bank. However, there is no commercial bank, which manages almost a trillion of loans without additional investment, trading and insurance activities. General rule: *the smaller the bank, the clearer the classification.*

Figure 3.10: Dependence on loans related income

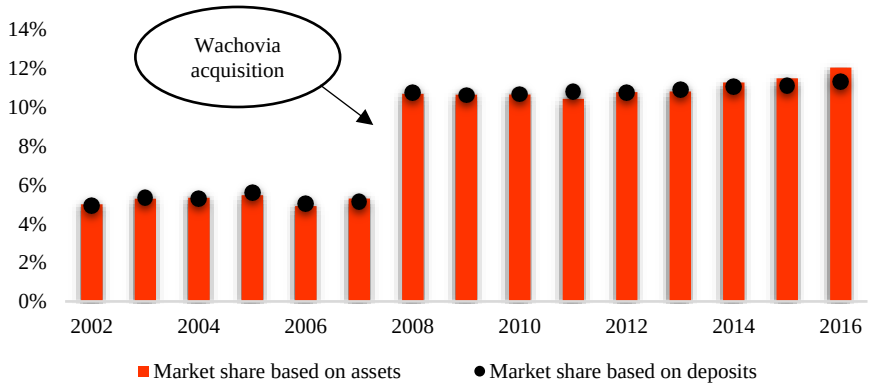


Source: Company data, annual reports 2015

The Bank's competitors are therefore mostly other commercial banks, savings banks and savings institutions, which may be placed into two groups. First group consists of banks, which operates all over the country (from coast to coast) such as JPMorgan Chase or Bank of America Merrill Lynch. The other group incorporates regional and thrift banks and savings institutions. Wells Fargo's business model is unexciting in comparison to investment banks such as Goldman Sachs. However, as proved by the BIS' study, commercial banks' profits are more stable and higher in the long-term.

Wells Fargo manages in its balance sheet the highest amount of loans from all the banks in the United States. That is remarkable especially when considering that WFC is only the third biggest bank by total assets in the United States. Its market share based on the total loans reaches more than 11%, a very significant portion given the size and competition in the market. The market share of Wells Fargo based on the total deposits and total assets is illustrated by the Figure 3.11[9293]. By all odds, Wells Fargo belongs to the most important players in the industry and holds valuable intangible assets in the form of brand awareness and customer recognition.

Figure 3.11: WFC market share analysis



Source: FRED Economic Data, WFC annual reports

3.2.3 Competitive Positioning

The bank has been widely considered as having several competitive advantages over its peers. These advantages were oftentimes quoted as a reason why the bank was traded with a premium to the sector. The author has decided to further scrutinize these qualities and proceed with an independent analysis of the up-to-date data.

- **Low Cost of Funding**

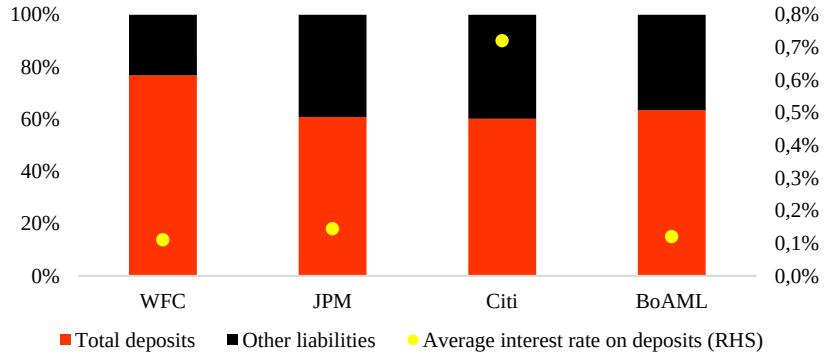
  Banking is a financial intermediation business. Hence, the bank which is able to attract funds with the lowest cost will gain a competitive advantage. Deposits in general are the most

[92] Total Checkable Deposits. FRED Economic Data [online]. 2017 [cit. 2017-03-03]. Available at: https://fred.stlouisfed.org/series/TCDNS#0

[93] Savings Deposits - Total. FRED Economic Data [online]. 2017 [cit. 2017-03-03]. Available at: https://fred.stlouisfed.org/series/SAVINGNS#0

economical type of funding. Wells Fargo has the highest percentage of deposits in relation to its liabilities from the measured peers. Moreover, it is able to attract deposits with the lowest costs. Therefore, the bank has been funded very cheaply. However, current legislation in the form of total loss absorbing capacity (TLAC) rule will probably force WFC to increase the proportion of bond-funding. Its advantage in terms inexpensive funding is therefore forecasted to diminish.

Figure 3.12: Deposits funding



Source: Company data, 2015 annual reports

- **Revenue Diversification**

The bank has also been very successful in balancing its interest and non-interest income, which results in more stable profits during the business cycle, since non-interest income is not as volatile as the income generated by loans. However, even though the revenue diversification is often quoted as Wells Fargo's competitive advantage, the executed analysis questions such a conclusion.

Table 3.1: Revenue diversification

Bank	NII as % of Net Revenue	Noninterest Income as % of Net Revenue
WFC	54%	46%
JPM	48%	52%
BoAML	52%	49%
Citi	65%	35%

Source: Companies' quarterly reports 2016

Only Citigroup has not been very successful in a diversification of its revenues and has higher exposure to cyclical business. However, JPMorgan Chase and Bank of America were also able to diversify their revenues. Moreover, Wells Fargo's non-interest income is expected to be overhauled with regard to the recent scandal including fraudulent accounts and credit cards. The impact of the scandal may be very significant. For that reason, the topic is further analysed in the following part of the thesis.

- **Lower Regulatory Requirements**

  Wells Fargo's business is oriented mainly on commercial banking and thus bears less risk than its peers. The regulator acknowledges the situation and therefore requires the bank to comply with more lenient globally systematically important bank (G-SIB) capital surcharge, which totals to 1.5% of the bank's risk-weighted assets. JPMorgan Chase and Bank of America Merrill Lynch face G-SIB buffer of 2.5%[94], which naturally lowers their profitability. The situation results in a significant competitive advantage for Wells Fargo as a reward for having more stable and less risky business. Naturally, investors prioritize WFC with regard to both points mentioned above.

- **Competent Management**

  From investors point of view, the banking is very risky business. The ordinary total assets to equity ratio is close to 9, which is also the case for Wells Fargo. With such a high leverage, management decisions translate into considerable swings in the net income. Wells Fargo has been managed competently by skilled and experiences managers for many years, which made the company a structural winner. Management's low risk appetite helped the bank to overcome severe difficulties in 2008-2009 and made the company after the financial crisis even stronger. Current leaders seem to be also skilful and are expected to navigate the bank competently in the near future. That applies even despite present headwinds related to the bank's fraudulent behaviour, sales quotas and especially large amount of negative public awareness.

- **Extensive Branch Network**

  Wells Fargo is a typical consumer-oriented bank with almost 85% of sales generated through extensive branch network. The bank uses its size and utilizes the economies of scale. The extensive branch network has always helped the bank to retain stable and strong relationships with customers. However, in the era of technological change such a strategy does not have to be necessarily the winning one. In order to cut costs, WFC has expanded aggressively in the last few years and invested into technologies, online banking and so on. However, the bank has enjoyed low capital expenditures for too long; its technological infrastructure is obsolete in comparison to its peers and needs to develop substantially in order to stay competitive in the future.

[94] 2016 list of global systemically important banks (G-SIBs). *Financial Stability Board* [online]. 2016 [cit. 2017-03-03]. Available at: http://www.fsb.org/wp-content/uploads/2016-list-of-global-systemically-important-banks-G-SIBs.pdf

- **Strong Customer Relationships and Corporate Governance**

  Wells Fargo has built its business on cross-selling, high reputation and great relationships with its customers. Loyal customers purchase more products and advocate the bank in the presence of other potential clients. Therefore, by retaining lifelong clienteles, the bank is able to cut expenses on marketing and ensure the stable supply of new customers at the same time. In addition, cross-selling improves revenue per customer and customer retention.

  The bank promotes itself as a community-based financial services firm, always close to its customers, which is proven by the extensive branch network. The strategy has worked for many years. However, the aggressive selling practices and strong focus on cross-selling have resulted in an excessive pressure on employees, national scandal and tarnishment of the bank's reputation. In autumn 2016 the regulators reported fraudulent behaviour of WFC. Its employees opened more than 2 million fake accounts and charged customers related fees[95]. All of this in order to comply with strict cross-selling quotas and earn high bonuses or at least retain their jobs. WFC's cross-selling strategy has been an example for its peers for many years. Even without the fraudulent products, bank's cross-selling rate has been incredible. Nevertheless, the strategy has been overhauled, which resulted in an elimination of product sales goals for retail bankers. Naturally that lowers the pressure on employees and eases the public criticism, but it will also probably depress company's net revenue in the years to come. The real impact of the measure still remains to be seen.

  Corporate governance, incentive program and other internal processes should prevent these events from taking place. However, that did not happen. Thus, the bank's reputation, which has always been glorified, faces a significant setback. Nevertheless, the corporate governance processes and guidelines are well-written and standardized. Their quality was recently further improved by endeavour of the major shareholders after the scandal. Approximately 80% of the management's compensation is variable and dependent on the bank's performance. The system worked well in the past and is expected to continue to do so in the future. The Table 3.2 shows annual Chief Executive Officers' compensation and its variable portion. Since the CEO's pay is highly followed by the general public, the structure and amount are rather standardized. However, the compensation of Mr. James Dimon (CEO, JPMorgan Chase) is significantly higher. The variable portion is also higher for the CEOs of BoAML and Citi, however, their equity portion is lower. This kind of compensation incentivizes the CEOs to prioritize short-term results, which is certainly not beneficial for the long-term shareholders.

[95] More Wells Fargo customers may be affected by sales scandal, according to filing. *CNBC* [online]. 2017 [cit. 2017-03-13]. Available at: http://www.cnbc.com/2017/03/01/more-wells-fargo-customers-may-be-affected-by-sales-scandal-according-to-filing.html

Table 3.2: CEO compensation

Bank	CEO Pay	Variable Portion	Equity Portion
WFC	$19.3 million	85%	70%
JPM	$27.0 million	94%	76%
BoAML	$16.0 million	91%	63%
Citi	$16.5 million	91%	60%

Source: Companies' proxy statements 2016

To sum up, Wells Fargo is believed to be a high-quality bank, which is seldom attractively valued when considering long-position. The analysis of presumed competitive advantages, however, revealed slightly worsening position of the bank. The financial analysis part of the thesis incorporates a comprehensive analysis of specific financial statement items and further elaborates on the business analysis and competitive positioning, especially in terms of credit quality and capitalization. However, all qualitative conclusions based on the analysis of competitive advantages indirectly enter into the financial model in the form of forecasting assumptions and consequently influence the calculated intrinsic value of the company.

3.3 Financial Analysis & Financial Modelling

Financial analysis represents the next step of the fundamental analysis. Virtually, a financial analysis is an analysis of the financial statements of the company[96]. As a matter of course, notes attached to the financial statements cannot be excluded, since they usually carry the most valuable information. Moreover, financial statements should be forecasted using all the data available e.g. industry statistics, management discussions, competitors' data etc. Investors should not limit themselves to the historical financial statements of the specific company, since they would risk missing a "big picture" or rely considerably on management's sincerity.

There are three basic types of a financial analysis. Time-series analysis helps an analyst to determine, how the firm performed and is likely to perform over time. The analysis is based on both historical data and forecasted data. The specific type of a time-series analysis is a financial ratio analysis. Ratios are meaningless, unless compared to other ratios. However, the goal of the process is to estimate future development of financial ratios based on the past several years and current business knowledge. The second type of the financial analysis is an analysis of common statements. When using the common statements analysis, all the items on the balance sheet and income statement are stated as a percentage of net revenues or total assets. This type of analysis helps an analyst to see financial statements in a format, which is easy to interpret. Benchmarking and the industry financial analysis compare firm's performance to its peers. Frequently, the ratio analysis is used[97].

[96] Financial analysis. *NASDAQ* [online]. 2012 [cit. 2017-03-03]. Available at: http://www.nasdaq.com/investing/glossary/f/financial-analysis

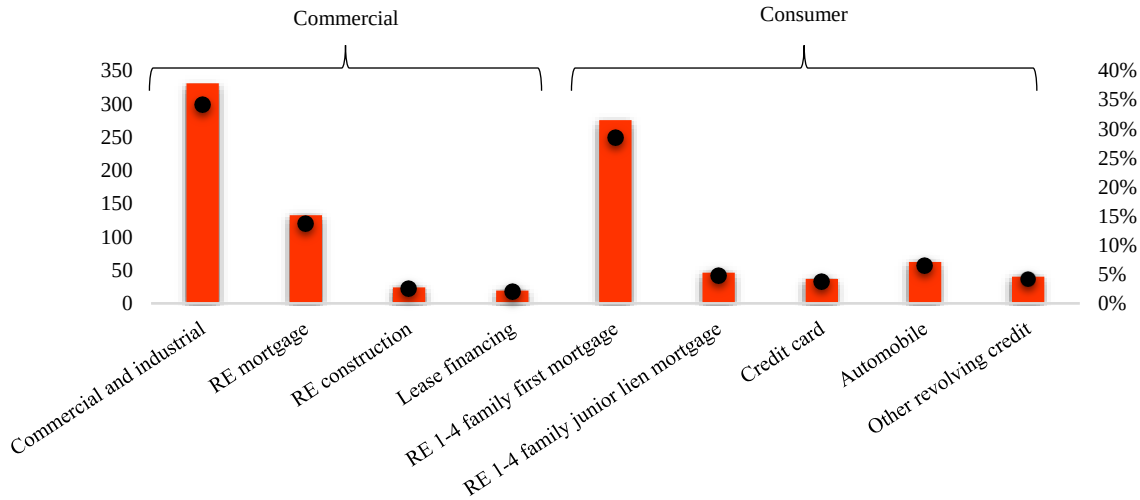
[97] How Do You Do Financial Statement Analysis? *The Balance* [online]. 2016 [cit. 2017-03-03]. Available at: https://www.thebalance.com/how-do-you-do-financial-statement-analysis-393235

The valuation of WFC described in this thesis is based on the construction of the forward-looking financial statements. The financial model created is therefore inseparable part of the thesis. It is important to note, that truly thorough equity research report and comprehensive financial model would exceed the scope of the thesis. For that reason, the author committed several simplified assumptions regarding the stub-periods, preferred and ESOP shares, exchange rate effects, extraordinary income and expense etc. Despite that, the valuation should indicate if the stock is undervalued, fairly valued or overvalued. The next chapters aim to analyse individual financial statement categories and explain the reason behind the assumptions on which the forecasting of the forward-looking statements is based on.

3.3.1 Loan Portfolio

The basic partition of Wells Fargo's loan portfolio is into commercial and consumer loans. Their share on total loans is almost identical, commercial loans having 52% and consumer loans 48%. Additionally, both groups are further subdivided into respective subcategories. The author follows the same principle of division as Wells Fargo does. Commercial loans consist of commercial and industrial loans, real-estate mortgages, real-estate construction loans and lease financing. The consumer loans are subdivided into real-estate 1-4 family first mortgages, real-estate 1-4 family junior lien mortgages, credit cards, automobiles and other revolving credit. The respective shares (RHS) and total amounts of the specific categories are shown in the Figure No. 3.13 (as of 31st of December 2016).

Figure 3.13: Loan portfolio ($bn)



Source: Wells Fargo quarterly report Q4 2016

The future development of the loan portfolio depends on many factors such as the economic growth, pricing, brand awareness etc. Currently, the Federal Reserve is tapering its monetary policy and the economy is expected to grow at a stable pace. Therefore, the growth rates of respective categories are forecasted to steadily approach the terminal growth rates. The financial model is very complex and simple figures in the thesis cannot depict all corresponding relationships. Hence, the author

recommends readers to make a use of the model attached to the paper in order to fully comprehend the valuation.

Unfunded credit commitments are inseparably connected to the loan portfolio even though they are not directly shown in the balance sheet. WFC applies the same credit standards for these commitments as for all of their credit activities. A significant portion of these commitments will expire without being used. However, it is crucial to keep in mind the fact that commitments to lend may drain the liquidity in the recession, which may substantially harm the bank's condition. The unfunded credit commitments totalled to $550 billion in the end of 2016. That is a major amount considering the total gross loans of $920 billion.

The credit risk is inseparably connected to the loan portfolio and will be further analysed in the credit quality chapter. Wells Fargo is one of the biggest banks in the world and for that reasons it is reasonable to advance to country risk exposure analysis. When calculating the total amounts in the loan portfolio, the foreign commercial loans were aggregated with the United States commercial loans. There are three basic reasons behind the aggregation. The first one and at the same time the most important one is the unavailability of the detailed information about foreign loans, which would make potential forecasting precise. Secondly, the company's country risk exposure on an ultimate country risk basis is thoroughly managed by an active risk management. By far the largest single foreign country exposures were to the United Kingdom and Canada, which totalled to $42.43 billion or approximately 72% of the total foreign loans. Economies of the United Kingdom and Canada are tightly intertwined with the United States economy. Therefore, it is reasonable to assume similar default rates as in the United Stated. Approximately 23% of the total foreign loans were given to the entities headquartered in the Eurozone, which also reacts similarly to the key drivers of the global economy as United States economy does. The remaining 5% of the country risk exposure was spread all over the world without any single country having substantial share. To sum up, Wells Fargo does not bear substantial country risk exposure to any country with a high-risk profile.

3.3.2 Net Revenue

Financial services firms usually do not have clearly defined sales or revenues. The item which is the closest, however, is the specially defined net revenue. Net revenue consists of net interest income (NII) and non-interest income[98], which includes in the case of WFC mainly fees, commissions and net gains on debt and equity investments.

[98] Banking Account & Ratio Definitions. *Moody's* [online]. 2011 [cit. 2017-03-03]. Available at: https://www.moodys.com/sites/products/ProductAttachments/Banking%20Account%20and%20Ratio%20Definitions.pdf

- **Net Interest Income**

Net interest income (NII) is the difference between the interest income a bank earns on its lending activities and the interest expense paid to depositors[99]. NII represents the most important revenue item on the income statement of Wells Fargo. That is usually the case for every commercial bank. Basically, lending money and taking deposits is the elementary function of banks. There are numerous variables, which directly or indirectly influence the net interest income such as the net interest spread, brand, competitive positioning, interest rates prevailing in the economy, creditors' default probability, interest-rates sensitivity and as a matter of course the total value of interest-earning assets (IEAs) and interest-bearing liabilities (IBLs).

The author has decided to proceed with an aggregation of all IEAs into one category, since the individual analysis of respective IEA items would materially exceed the scope of the thesis. The same approach has been taken in the case of IBLs. Even though this approach is relatively simple, it provides an analyst with a very useful toggle reflecting changes in the macroeconomic environment. In addition, it is important to state that the intrinsic value of the company is exceptionally sensitive to changes in the IEAs, IBLs and respective yields due to high leverage and large asset base.

The composition of IEAs and IBLs is depicted by the Table 3.3. The main categories are as expected - loans, securities, deposits and long-term debt. Since the interest is generated throughout the year, it is appropriate to use the average amount of IEAs and IBLs.

Table 3.3: Average interest-earning assets and interest-bearing liabilities

Average interest-earning assets	$ billion	Average interest-bearing liabilities	$ billion
Federal funds sold	288	Interest-bearing deposits	891
Securities	356	Federal funds purchased	90
Available-for-sale	265	Other short-term borrowings	25
Held-to-maturity	91	Other borrowings & liabilities	17
Trading assets - debt	88	Long-term debt	239
Loans	950		
Mortgages and loans held for sale	23		
Other IEAs	6		
Average IEAs	**1 711**	**Average IBLs**	**1 262**

Source: Wells Fargo quarterly report Q4 2016

[99] Definition of 'Net Interest Income (nii)'. *Economic Times* [online]. 2013 [cit. 2017-03-03]. Available at: http://economictimes.indiatimes.com/definition/net-interest-income-nii-

All of these items stem directly or indirectly from the balance sheet. Indirect connection results from the fact that not all the trading assets earn an interest etc. The balance was forecasted within the range of currently available public information. The author expects the stable growth of the economy and stricter monetary policy. In addition, Wells Fargo is expected to retain its leading position in the consumer lending. Detailed growth rates and other assumptions are incorporated in the attached financial model.

Yield or interest paid on the interest-earning assets and interest-bearing liabilities is the second major key driver of the net interest income. These rates are closely related to the interest rates prevailing in the economy. The difference between average yield on IEAs and average interest rate on IBLs is called the interest rate spread (IRS) and represents another key component of the bank's business. The higher the IRS, ceteris paribus, the higher NII, since the bank is able to charge higher interest than it has to pay to its depositors. The IRS is expected to widen in the future, as the interest rates rise. The reason is a competitive pressure, which is assumed to temper as a result of a termination of the loose monetary policy. Naturally, interest paid to depositors is also forecasted to increase.

Figure 3.14: Average interest on IEAs and IBLs

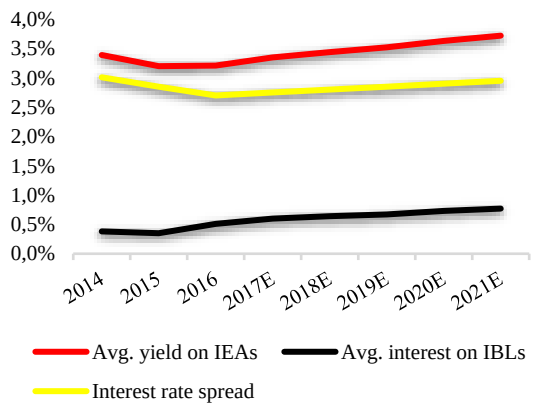
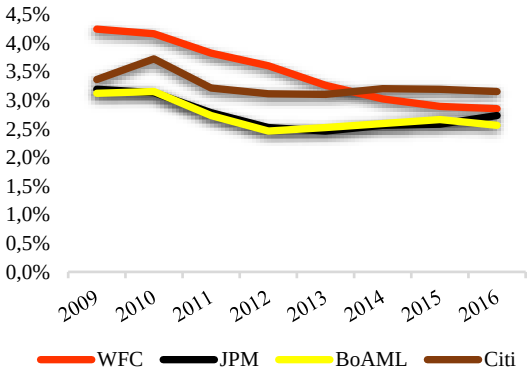


Figure 3.15: Net interest margin



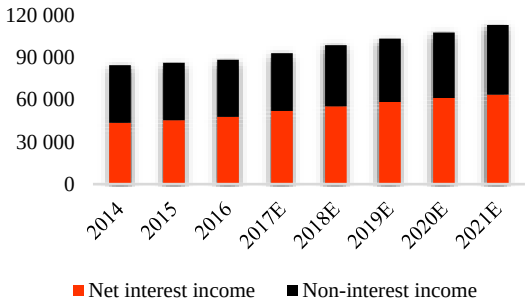
Source: Wells Fargo annual reports, Wells Fargo quarterly report Q4 2016, author's estimates

The key metric in the banking industry closely related to the net interest income is the net interest margin. The measure is calculated as the net interest income divided by the IEAs. The Figure 3.15 shows the erosion of NIM of Wells Fargo in the past years. Evidently, that is not a good sign for the bank. WFC has greatly expanded in the last 5 years and its IEAs have increased by 54%. However, the bank was not able to retain its prominent position in comparison to its peers even though it occupies the most profitable consumer segment. Since the bank's peers did not experience similar margin erosion, it is a considerably negative sign.

- **Non-interest income**

Non-interest income is the part of the net revenue stemming from other sources than interest rate spread. In case of Wells Fargo, it consists of various fees such as card fees, deposits account fees, mortgage fees or investments fees. The trading income, which is usually also a crucial part of the non-interest income, is for WFC of a less importance. Wells Fargo is exceptionally effective in balancing its net revenue groups. Even though the bank is commercial, its non-interest income forms 46% of its net revenue. That is a reasonable strategy, which should help WFC to perform even in times of lower credit growth. However, the balance between the groups is not expected to prevail in the future. Wells Fargo has been famous for its cross-selling strategy thanks to which the company was able to retain high non-interest income. However, the pressure put on employees was too high and the management not even crossed the moral line, but also overlooked illegal actions regarding the fake accounts and credit cards. The recent changes in the company's strategy are expected to have significant influence on the future development of the non-interest income. In addition, the forward-looking entries were estimated assuming the stable economic growth and growing pressure on some fees as mortgage fees.

Figure 3.16: Net revenue composition ($m)



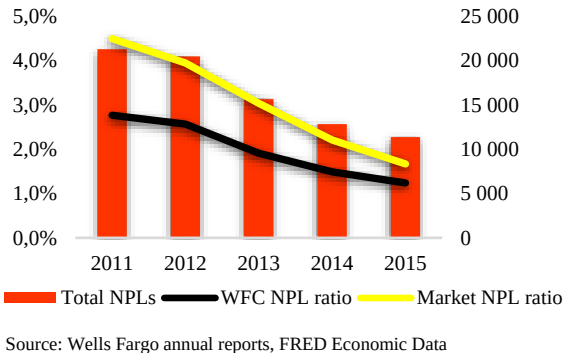
Source: Wells Fargo annual reports, author's estimates

3.3.3 Credit Quality

The overall credit quality of the loan portfolio has deteriorated significantly during the financial crisis. Moreover, when the Bank acquired Wachovia, it had to record substantial amount of purchased credit-impaired loans (PCI loans). These loans are characteristic by their low credit quality. The acquirer assumes that contractually required payments as principal and interest payments are improbable to take place in full amount. Almost all Wells Fargo's PCI loans were acquired in the Wachovia acquisition and went down from $58.8 billion in 2008 to $20.0 billion in 2015. PCI loans therefore accounted for approximately 2% of the WFC's loan portfolio.

Nevertheless, the credit quality of the loan portfolio has been improving since the end of the financial crisis and currently is very positive. The net charge-offs of $3.5 billion were 0.37% of average loans in 2016, which is near historical lows. Wells Fargo has substantial exposure towards the real-estate market. These loans, commercial and consumer, account for almost 50% of the loan portfolio. Since the conditions in the real-estate market have been improving in the last years, the losses real-estate related loans have been declining. According to the Wells Fargo's annual report, approximately 67% of the consumer first mortgage portfolio was originated after 2008, when new underwriting standards were enacted. That is another sign of a good credit quality, since 2008 regulation dealt specifically with subprime mortgages and introduced higher requirements for borrowers.

Figure 3.17: Nonperforming loans ($m)



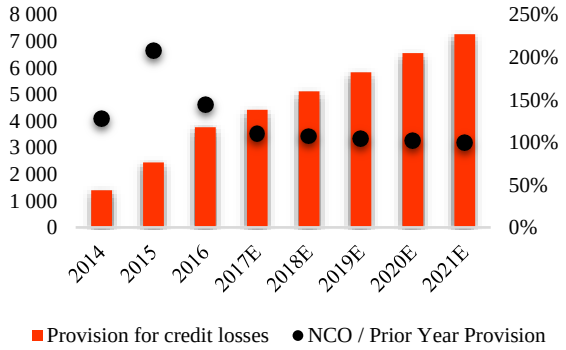
Source: Wells Fargo annual reports, FRED Economic Data

WFC has been able to keep the NPL ratio very low. That is especially visible when comparing the values to the market[100]. In addition, even though the loan portfolio has risen by 4.5% CAGR in the 2011-2015 period, bank's nonperforming loans have decreased by 14.5% per annum. Naturally, that is a consequence of the low interest rates and improving macroeconomic environment, but bank's cautious risk management strategy has been also contributing to the positive result.

Charge-Offs and Loan Loss Reserves

The United States banks report on their balance sheets gross loans. These loans are gross of provisions for credit losses, but net of so called charge-offs. A charge-off is a loan that is removed from a company's balance sheet and charged against loan loss reserves[101]. Typically, loans which are no longer collectible due to bankruptcy or default are charged-off. Especially during the financial crisis banks reported high charge-offs, which substantially exceeded expected losses indicated by the provisions for credit losses. Since default rates all over the world significantly increased, banks were not able to collect payments on the loans they gave out and were forced to charge them off. Nevertheless, charge-offs are not directly reflected on the income statement, but only on the balance sheet. As a result, during the financial crisis, banks charged-off high amounts of bad loans, but their net income did not reveal the actual losses. That confused investors and analysts, since banks looked more profitable than they actually were. For that reason, it is essential to forecast charge-offs and provision for loan losses on a separate worksheet and pay particular attention to them.

Figure 3.18: Provision for credit losses ($m)



Source: Wells Fargo annual reports, author's estimates

WFC's charge-offs were forecasted as a percentage of the total gross loans in the same year. The 5-year model expects smooth shift from the current values to the future average period. The same pattern applies to the loan recoveries. Loan recoveries are monies which were collected on the previously charged-off loans. They are equally important as loan charge-offs, since higher recoveries reveal how much risk is really being taken by the bank and how successful bank is with the reinforcement of its claims. Loans provided by the bank may be

[100] Nonperforming Total Loans (past due 90+ days plus nonaccrual) to Total Loans. *FRED Economic Data* [online]. 2017 [cit. 2017-02-19]. Available at https://fred.stlouisfed.org/series/NPTLTL#0

[101] Global financial stability report: financial stress and deleveraging, macrofinancial implications and policy. Washington, DC: International Monetary Fund, c2008. ISBN 1589067576, page 10

backed by collateral or other enhancements, which may significantly boost potential recoveries. These conservative measures also reduce potential revenues, since the bank serves less high-yielding subprime borrowers without substantial assets.

Provision for credit losses is a widely tracked metric. It measures the allowance the bank is creating for future credit losses. Technically, provision for credit losses is a charge, which represents an expense deemed adequate by management given the composition of the bank's credit portfolio, creditors' probability of default, loss given default, the economic environment and the allowance for credit losses already established. The provision for credit losses incorporates both allowance for loan losses and allowance for unfunded credit commitments, whilst only the former one enters into the income statement as an annual expense.

The expected provisions for credit losses were forecasted as a percentage of an average loan balance. The value is estimated to reach 0.65% in the end of the 5-year long transition period. The net charge-offs and provisions for credit losses are closely related. The former should capture the actual losses, whilst the latter should establish adequate reserve for the losses. For that reason, the ratio of net charge-offs and provisions for credit losses is a helpful metric, which may give an analyst a valuable insight into the management's behaviour. In conclusion, the credit quality of WFC's loan portfolio is exceptionally good. The exact numbers, estimates and drivers are shown in the appendix due to the great extent of the financial model.

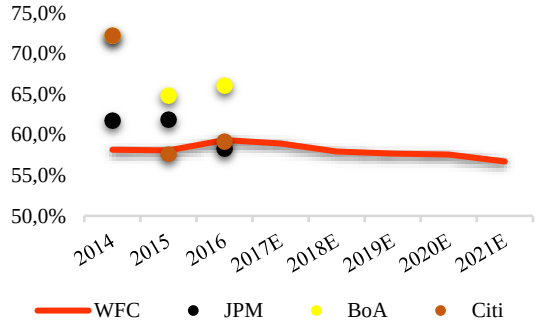
3.3.4 Non-Interest Expense

The non-interest expense is a charge not associated with attracting or keeping depositors' funds[102]. It includes almost all the operating expenses such as wages, employee benefits, equipment, occupancy, operation and maintenance facilities etc. The non-interest expense of Wells Fargo has amounted to $52.4 billion in 2016.

Arguably, the highest item regarding the non-interest expense of a bank is a personnel expense. Banks, in general, usually do not report capital expenditures, since they are not as important as for the manufacturing companies. Banks are dependent on a human capital. Nonetheless, investments into the human capital may be hardly capitalized when taking into account ordinary business operations. In any case, WFC has to generously reward its employees, since commercial banking is largely based on the personal relationships (even though this will probably change in the future). In 2016 personal expenses accounted for 61% of the bank's non-interest expenses. Given the size of the bank, there is a very low probability of great year to year changes in the number of employees or average expense per employee. For that reason, these drivers were used to predict future personnel expense. Other non-interest expenses were estimated considering the current situation, strategy and growth of the bank.

[102] Non-interest expense. *Investor Words* [online]. 2013 [cit. 2017-03-03]. Available at: http://www.investorwords.com/7413/non_interest_expense.html

Figure 3.19: Efficiency ratio



Source: Companies annual reports, author's estimates

Cost to income ratio, so called efficiency ratio, enables the comparison between banks and assessment of the current management. Nowadays, the cost-to-income ratio has been influenced mainly by decreasing net revenues of the banks. However, they have shown considerable resilience and were able to cut costs significantly. As far as WFC is concerned, the cost to income ratio is expected to stay at the elevated levels in the short-term, but should decrease as the interest rates rise.

3.3.5 Capitalization & Regulatory Requirements

Wells Fargo and each of its subsidiary banks are subject to regulatory capital adequacy requirements promulgated by the federal bank regulatory authorities. FED has established capital requirements for the consolidated financial holding companies. The OCC enforces similar requirements for the national banks. Moreover, WFC is approved seller/servicer of mortgages and is required to maintain a minimum level of shareholders' equity, as specified by various agencies, including United States Department of Housing and Urban Development, GNMA, FHLMC and FNMA. In general, national legislation states qualitative and compliance rules, which have to be met. International regulatory treaties establish quantitative capital adequacy and leverage ratios. The reason for the internationally recognized rules is the endeavour to prevent regulatory arbitrage, since the capital adequacy ratios strongly influence banks' strategy and dividend policy.

Wells Fargo is well-capitalized bank and complies with fully phased-in BASEL III capital adequacy ratios. The capital needs are primarily funded by the retained earnings as well as the issuance of preferred stocks and long and short-term debt. WFC has to comply with several capital adequacy and leverage ratios imposed by BCBS and FED. The capital rules requirements on a fully phased-in basis are summarized in the Table 3.4. The BASEL III capital rules are scheduled to be fully phased-in by the end of 2021. It is important to note that the capital surcharge is calculated annually, applies to all global systematically important bank and ranges between 1% and 4.5%. The surcharge for WFC totalled in 2016 to 1.5%. JPM and BoAML incurred higher surcharges due to higher risk profile of their RWAs, namely 2.5%[103]. That gives WFC a significant competitive advantage, since it is able to employ higher leverage and thus amplify the profitability. In addition, a counter-cyclical buffer may be imposed by regulators at their discretion, if they conclude that a period of excessive credit growth contributes to an increase in a systemic risk.

[103] 2016 list of global systemically important banks (G-SIBs). *Financial Stability Board* [online]. 2016 [cit. 2017-03-03]. Available at: http://www.fsb.org/wp-content/uploads/2016-list-of-global-systemically-important-banks-G-SIBs.pdf

Table 3.4: Wells Fargo regulatory ratios

Ratio	Minimum	Capital conservation buffer	Capital surcharge	Total requirement	Actual
Common Equity Tier 1	4.5%	2.5%	1.5%	8.5%	10.7%
Tier 1 capital	6.0%	2.5%	1.5%	10.0%	12.4%
Total capital	8.0%	2.5%	1.5%	12.0%	15.2%
Tier 1 leverage	4.0%			4.0%	9.3%
Supplementary	5.0%			5.0%	7.5%

Source: Wells Fargo 2015 annual report, author's estimates

Capital adequacy ratios are biased by the arbitrarily chosen values of risk associated with specific assets. On the other hand, leverage ratios take into account the absolute value of the assets. Leverage ratios are widely tracked since the financial crisis in 2008. Both approaches have their advantages and disadvantages, but analysts should pay close attention to both types of these ratios. The Tier 1 leverage ratio is calculated using the average total assets excluding goodwill and certain other types of mainly intangible assets. Supplementary leverage ratio is based on the same principle, but includes also off-balance sheet assets, derivative contracts and repo-style transactions.

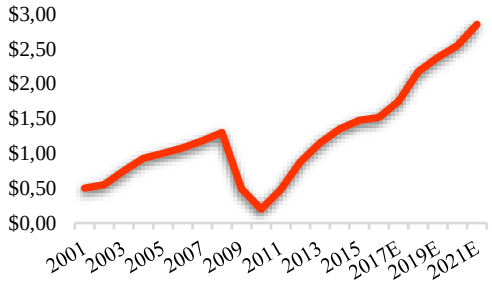
Currently proposed rules establish the total loss absorbing capacity, which consists of primarily Tier 1 capital and eligible long-term debt. These rules are strict and may force WFC to issue additional long-term debt. As of 31st of December 2016 the estimate of bank's TLAC is 20.7%. The expected required minimum as of 1st of January 2019 is 22%. The shortfall is approximately $18.1 billion, which should be reduced by the measured issuance. The newly proposed constraints would have significant impact on the bank's strategy of funding. However, lately elected president Donald Trump has been known for his criticism of the bank's regulation and Dodd-Frank Act. For that reason, it is possible that the currently proposed rules will be softened; compliance expenses will be lower than expected as well as TLAC required minimum.

In conclusion, WFC should be able to comply with all the future regulatory requirements without great difficulties even though it may slightly influence its profitability. The further information regarding the calculation of the regulatory ratios and forecasts is shown in the attached financial model.

3.3.6 Dividend Policy

Wells Fargo's dividend policy is closely linked to its capitalization. The capital adequacy ratios prevent the bank from dividend distributions and share buybacks which would result in dropping capital adequacy ratios below the required minimums. The bank, however, is very beneficial to its shareholders, since it has paid a dividend every year in its history. However, the dividend was rapidly cut in 2009 by 85% only two months after WFC acquired Wachovia, the fourth biggest bank in the United States at that time. WFC's assets and RWAs skyrocketed and the bank had to retain more capital in order to comply with all the capital adequacy ratios. CAGR of the dividend for the last 6 years is, however, over 40%. That only confirms that management is dedicated to deliver return to the shareholders.

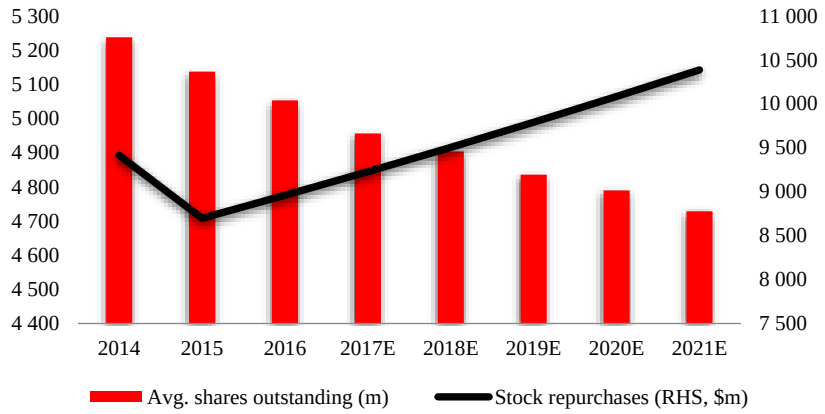
Figure 3.20: Dividend per share



Source: Wells Fargo annual reports, author's estimates

The bank also repurchases its own shares, which are then cancelled. The strategy increases portion of the company, which is owned by the remaining shareholders. As a matter of course, ceteris paribus, fewer shares outstanding also mean higher earnings per share and dividend per share. The author expects WFC to continue with its strategy consisting of appropriate balance between growth, dividends distributions and share repurchases. The financial model is based on the dividend payout ratio in the next five years, whereas stock issuances and share repurchases are forecasted separately. That gives an analyst comfortable toggle and enables him to quickly react to changes in company's strategy. In the second period of the model, the net payout ratio is utilized. The net payout ratio includes all the dividends, share repurchases and stock issuances in one aggregate metric. The Figure 3.22 shows expected average shares outstanding and stock repurchases in millions of dollars.

Figure 3.21: Capital common stock development



Source: Wells Fargo annual reports, author's estimates

3.4 Valuation

The process of valuation is the last part of the stock fundamental analysis. Its goal is to calculate the implied equity value (intrinsic value) of the company based on all the information analysed in the previous steps. The author has valued Wells Fargo using the three methods described in the theoretical part of the thesis. Moreover, in order to improve the informational value of the result, two methods of the cost of equity calculation were utilized.

3.4.1 Absolute valuation models

The author has decided to use 2-stage dividend discount model in order to keep the right balance between the precision of the valuation and its complexity. The 1st stage of the model, which lasts 5 years, is built on the theoretical concept explained in the first part of the thesis. Since the net income is generated in the course of a year, the discount period was adjusted to reflect such a scenario. The specific cash-flows are therefore discounted using the 0.5, 1.5, 2.5 etc. powers.

The terminal value was calculated using two different approaches. In general, the terminal value in DDM is very sensitive to its inputs. For that reason, it is reasonable to utilize different approaches to verify their validity. Firstly, the author has employed the Gordon growth model. The intrinsic value assumes 70% terminal net payout ratio (NPR). The forecasted dividend payout ratio in 2021 is 45%, which may seem incoherent. However, the 1st stage of the model is very detailed and encompasses share buybacks and common stock issuances separately from the pure dividend payout ratio. The terminal value assumes net payout ratio, which incorporates common dividends, common stock repurchases and issuances. The net payout ratio as defined above equalled to 71.3% in 2016. Secondly, the terminal value has been calculated using the P/TBV multiple of WFC's peers, which was at the time of valuation 1.72x. The second approach employing the opportunity cost as a cost of equity utilized a standard formula and results in 1.91x.

The return on common equity enters into the calculation indirectly through the sustainable growth rate. The RoCE is more appropriate measure of profitability, since it excludes preferred stock and minority interest, which is crucial while calculating value of the common equity and using common dividends. The terminal RoCE of 11.5% and the terminal NPR of 70.0% result in a sustainable growth rate of 3.5%. Such a terminal growth rate is reasonable when taking into account an assumption of inflation being 2% and real GDP growth rate approximately 1.5%. The hypothesis assumes stable leverage of the economy with a potential deleveraging if the real GDP growth outperforms the assumption.

The last input necessary to proceed with the calculation is the cost of equity. The CoE based on the opportunity cost has been calculated in one of the previous chapters and in the 1st stage and terminal stage totalled to 4.4% and 7.7%, respectively. The standardized approach is based on the famous CAPM model. The author has used the yield on 10Y US treasuries as a risk-free rate[104]. The equity

[104] US 10-YR. *CNBC* [online]. 2017 [cit. 2017-03-03]. Available at: http://data.cnbc.com/quotes/US10Y

risk premium was estimated by Duff & Phelps to be 5.5%[105]. Professor Damodaran regularly publishes an equity risk premium for the United States, which at the time of valuation totalled approximately to 5.7%[106]. The author has decided to utilize conservative 5.75% equity risk premium. Markets are mostly efficient, however not perfectly efficient, and analysts probably should not use simple historical beta as a proxy for the risk. The median beta of Wells Fargo's peers has been used. Its complete calculation is shown at the Figure 3.22.

Figure 3.22: Traditional calculation of the cost of equity (capital asset pricing model)

Name	Levered beta
JPMorgan Chase & Co.	1.12
Bank of America Merrill Lynch	1.21
Citigroup Inc.	1.25
Bank of Montreal	1.16
The Toronto-Dominion Bank	1.02
Bank of New York Mellon Corp	1.04
PNC Financial Services	0.92
US Bancorp	0.81
Median	**1.08**

Risk-free rate	2.40%
Equity risk premium	5.75%
Beta	1.08
Cost of equity	**8.6%**

Source: Bloomberg, Duff & Phelps, Damodaran NYU Stern, author's calculation

Firstly, the intrinsic value has been calculated employing the standard method of the cost of equity. The complex calculation of the implied equity value using the dividend discount model is included in the appendix and summed up at the Figures 3.23 and 3.24. The Gordon growth model results in a present implied equity value per share of $55. The second approach utilizing the peer's P/TBV multiple implies the intrinsic value per share of $58.

Residual income model results in an implied equity value per share of $58. The model's advantage is its lower dependency on the terminal value, which is by definition very subjective and hardly predictable. Almost 60% of the total calculated value is based on the current value of the common equity. Only 30% is given by the perpetual value calculation. The author does not expect terminal RoE to approach terminal CoE in the long-term as is usually recommended in the textbooks. WFC's competitive advantage is probably slightly disrupted by the current development (fintech, loss of reputation, erosion of NIM). However, banking industry due to its specifics such as high regulatory requirement, brand loyalty, high capital requirements, lobby etc. is unlikely to become perfectly competitive (state characterized by the RoE equal to CoE). For that reason, the terminal cost of equity using the CAPM model totals to 8.6%, whilst the terminal return on common equity is forecasted to reach on average of 11.5% in the future periods.

[105] Duff & Phelps Increases Recommended U.S. Equity Risk Premium from 5.0% to 5.5%. *Duff & Phelps* [online]. 2016 [cit. 2017-03-03]. Available at: http://www.duffandphelps.com/insights/publications/cost-of-capital/duff-phelps-increases-recommended-us-equity-risk-premium-from-5-0-to-5-5

[106] Country Default Spreads and Risk Premiums. *NYU Stern* [online]. 2016 [cit. 2017-04-09]. Available at: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

Secondly, the author has used the cost of equity based on the opportunity cost. As a matter of course, at first sight, the implied equity values per share are higher. The reason is that the risk has not been considered yet. Margin of safety serves as a measure of risk. Benjamin Graham recommended margin of safety at least 30%. The author believes that the visibility has improved significantly in the last decades. Consequently, investors probably should not require such high margins of safety. By applying high value of MoS, investor's may also forego great opportunities, which is in the end the same mistake as investing into low-performing stocks. After the inclusion of the 25% margin of safety, Gordon growth model and DDM using the peer's P/TBV multiple result in an implied equity value per share of $58 and $56, respectively. The residual income model calculates the intrinsic value per share to be $61. The valuation process is exceptionally complex and readers may find a complete valuation model in the appendix. However, a short summary of the absolute valuation models is depicted by the figures below.

Figure 3.23: Dividend discount and residual income models

Wells Fargo & Co. - Dividend Discount Model & Additional Data						
($ in Millions Except Per Share Data)	**Historical**	**Projected**				
	2016	2017E	2018E	2019E	2020E	2021E
Normalized Net Income to Common:	$ 20,373	**$ 21,613**	**$ 23,672**	**$ 25,550**	**$ 27,116**	**$ 29,960**
% Growth:	(5.1%)	6.1%	9.5%	7.9%	6.1%	10.5%
Common Dividends:	**7,399**	**8,645**	**10,652**	**11,497**	**12,202**	**13,482**
% Growth:	(0.0%)	16.8%	23.2%	7.9%	6.1%	10.5%
Dividend Payout Ratio:	36.3%	40.0%	45.0%	45.0%	45.0%	45.0%
Beginning Common Equity:	$ 171,998	$ 171,998	$ 179,589	$ 187,040	$ 195,307	$ 204,358
Plus: Net Income to Common:		21,613	23,672	25,550	27,116	29,960
Plus: Stock Issuances:		1,890	1,947	2,006	2,066	2,128
Plus: Stock-Based Comp.:		1,960	1,987	1,998	2,154	2,347
Less: Stock Repurchases:		(9,227)	(9,503)	(9,789)	(10,082)	(10,385)
Less: Common Dividends:		(8,645)	(10,652)	(11,497)	(12,202)	(13,482)
Ending Common Equity:	**$ 171,998**	**$ 179,589**	**$ 187,040**	**$ 195,307**	**$ 204,358**	**$ 214,927**
Tangible Common Equity / Tier 1 Common Capital Calculation:						
Ending Common Equity:	$ 171,998	$ 179,589	$ 187,040	$ 195,307	$ 204,358	$ 214,927
Less: Disallowed Intangibles	(29,400)	(28,719)	(27,675)	(26,721)	(26,711)	(26,705)
Less: Investments in Subsidiaries:	800	(400)	(400)	(400)	(400)	(400)
Total Tier 1 Common Capital:	**$ 143,398**	**$ 150,470**	**$ 158,965**	**$ 168,186**	**$ 177,247**	**$ 187,822**
Discount Period:		1.0	2.0	3.0	4.0	5.0
Mid-Year Discount Period:		0.5	1.5	2.5	3.5	4.5
PV of Dividends (CAPM):		$ 8,295	$ 9,410	$ 9,351	$ 9,137	$ 9,295
PV of Dividends (Opportunity cost):		$ 8,461	$ 9,986	$ 10,324	$ 10,496	$ 11,108

Wells Fargo & Co. - Residual Income Model						
Residual Income / Excess Returns (CAPM):		**$ 6,467**	**$ 7,878**	**$ 9,079**	**$ 9,899**	**$ 11,898**
Residual Income / Excess Returns (Opportunity cost):		**$ 13,881**	**$ 15,609**	**$ 17,141**	**$ 18,327**	**$ 20,740**
Discount Period:	0.0	1.0	2.0	3.0	4.0	5.0
Mid-Year Discount Period:		0.5	1.5	2.5	3.5	4.5
PV of Residual Income (CAPM):		$ 6,205	$ 6,960	$ 7,384	$ 7,412	$ 8,203
PV of Residual Income (Opportunity cost):		$ 13,585	$ 14,633	$ 15,393	$ 15,764	$ 17,088

Source: Author's estimates

Figure 3.24: Absolute valuation

Absolute Valuation					
($ in Millions Except Per Share Data)					
Terminal Earnings Growth Rate:		3.5%	Terminal Earnings Growth Rate:		3.5%
Return on Common Equity:		**11.5%**	**Return on Common Equity:**		**11.5%**
Return on Common Tangible Equity:		**12.3%**	**Return on Common Tangible Equity:**		**12.3%**
Terminal Net Payout Ratio:		70.0%	**Terminal Net Payout Ratio:**		70.0%
Cost of Equity - CAPM			**Cost of Equity - Opportunity Cost**		
Cost of Equity 5Y:		8.6%	**Cost of Equity 5Y:**		4.4%
Terminal Cost of Equity:		8.6%	**Terminal Cost of Equity:**		7.7%
Beta:		1.08	**Margin of Safety:**		25%
Dividend Discount Model:			**Dividend Discount Model:**		
Sum of PV of Dividends:	$	45,489	Sum of PV of Dividends:	$	50,375
Terminal P / TBV:		1.72 x	Terminal P / TBV:		1.91 x
PV of Terminal Value (Growth):	$	234,369	PV of Terminal Value (Growth):	$	342,588
PV of Terminal Value (Multiple):	$	249,557	PV of Terminal Value (Multiple):	$	331,208
DDM PV of Equity (Growth):	**$**	**279,858**	**DDM PV of Equity (Growth):**	**$**	**392,963**
DDM PV of Equity (Multiple):	**$**	**295,046**	**DDM PV of Equity (Multiple):**	**$**	**381,583**
Residual Income Model:			**Residual Income Model:**		
Current Value of Common Equity:	$	171,998	Current Value of Common Equity:	$	171,998
Sum of PV of Residual Income:	$	36,164	Sum of PV of Residual Income:	$	76,462
Residual Income Terminal Value:	$	83,973	Residual Income Terminal Value:	$	162,851
RI PV of Equity:	**$**	**292,134**	**RI PV of Equity:**	**$**	**411,311**
Diluted Shares:		5,069	Diluted Shares:		5,069
Implied Share Price - CAPM			**Implied Share Price - Opportunity Cost**		
Implied Share Price DDM (Growth):	$	55	Implied Share Price DDM (Growth, 25% MoS):	$	58
Implied Share Price DDM (P/TBV Multiple):	$	58	Implied Share Price DDM (P/TBV Multiple, 25% MoS):	$	56
Implied Share Price DDM:	**$**	**57**	**Implied Share Price DDM (25% MoS):**	**$**	**57**
Implied Share Price RI:	**$**	**58**	**Implied Share Price RI (25% MoS):**	**$**	**61**

Source: Bloomberg, author's calculation

3.4.2 Relative valuation

Relative valuation represents completely different mechanism of valuing companies. The theoretical approach has been set earlier in the paper and therefore the author instantly proceeds with its application on WFC.

Two different multiples have been used to determine the intrinsic value of WFC - price to earnings and price to tangible book value. The second multiple slightly differs from the multiple explained in the theoretical part. The tangible book value excludes mainly goodwill and intangible assets from the book value of the company. This eases the process, since sizeable American corporations have accumulated large amount of goodwill, which could complicate the comparison. The evident peers of WFC are JPMorgan Chase, Bank of America and Citigroup. However, all the banks listed in the

Figure 3.22 have been considered when calculating peers' P/E and P/TBV. The list has been compiled considering large banks operating in the North America as Wells Fargo's peers.

The implied equity value results in a value of $61 and $62 per share using P/E and P/TBV multiples, respectively. The author has used the achieved multiple in 2016 and forward P/E for 2017 and 2018 to average out potential high volatility of earnings. The same principle has been used for P/TBV multiple. It is very common to value large banking corporations simply using the relative valuation. DDM and RI have their shortcomings and when added to the complexity of a bank, their outcomes do not have to be necessarily more precise. Interestingly, WFC is traded almost exactly at the same P/E and P/TBV multiples as its closest competitor - JPMorgan Chase.

WFC has been historically virtually always traded with a premium to its peers, since the company was believed to possess a significant competitive advantage. Currently, however, the trading gap is narrowing. The fraudulent behaviour not only tarnished bank's reputation, but also harmed its earnings and consumers' activity. Therefore, it is reasonable to apply conservative raw peer's multiple without any premium leaving the valuation a potential upside. The summary of a relative valuation is shown by the Figure No. 3.25 and Figure No. 3.26.

Figure 3.25: Relative valuation – multiples calculation

Name	P/E	P/TBV
Wells Fargo & Co.	13.74	1.77
JPMorgan Chase & Co.	13.92	1.77
Bank of America Merrill Lynch	15.44	1.40
Citigroup Inc.	12.59	0.93
Bank of Montreal	13.30	2.12
The Toronto-Dominion Bank	13.79	2.50
Bank of New York Mellon Corp	14.97	3.44
PNC Financial Services	16.32	1.66
US Bancorp	7.71	1.45
Median	**13.86**	**1.72**

Source: Bloomberg, author's calculation

Figure 3.26: Relative valuation – implied share price

Definition	2016	2017E	2018E
Net income	20,373	21,613	23,672
Tangible book value	171,097	180,571	187,311
Diluted shares outstanding	5,069	4,952	4,822

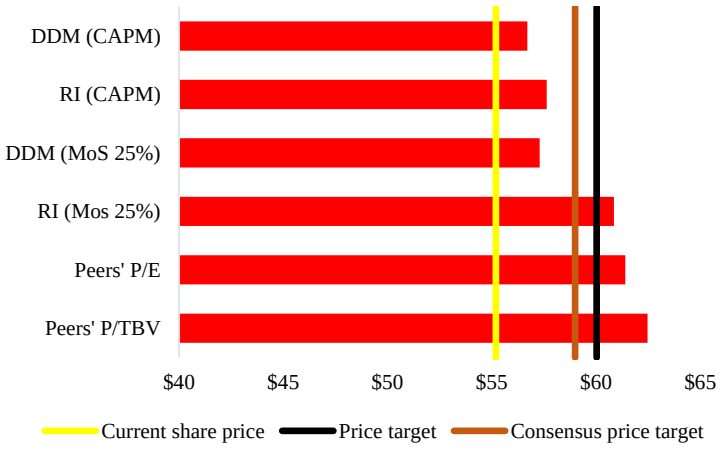
Relative Valuation - Implied share price		
Implied Share Price (P/E 2016):	$	56
Implied Share Price (P/E 2017):	$	60
Implied Share Price (P/E 2018):	$	68
Implied Share Price P/E:	**$**	**61**
Implied Share Price (P/TBV 2016):	$	58
Implied Share Price (P/TBV 2017):	$	63
Implied Share Price (P/TBV 2018):	$	67
Implied Share Price P/TBV:	**$**	**62**

Source: Wells Fargo quarterly report Q4 2016, author's estimates

3.4.3 Valuation summary

The current stock price of the bank is $55.2 as of 9th of May 2017. The Figure number 3.27 summarizes the valuation and graphically depicts the current share price, author's price target and consensus price target. The price target has been calculated as an average implied equity value per share of the models shown in the figure below and totals to $60 per share. Such a price target implies an upside potential of 9%.

Figure 3.27: Valuation summary



Source: Bloomberg, author's calculation

Due to the page limit given by Masaryk University, risks of the investment will not be further scrutinized, even though the comprehensive fundamental analysis would certainly incorporate special chapter regarding the potential threats. The same applies for the sensitivity analysis, which should be carried out mainly for the operating metrics such as yields, loan growth rates and cost of risk.

Nonetheless, **the author issues a long-term buy recommendation** despite only 9% upside. The investment case is based on the relative superiority of Wells Fargo in comparison to its peers. The bank is exposed the most to the stable and profitable commercial consumer banking. There is a little room for large mistakes in such a high-leveraged industry. The third reason is the management's clear intention to reward the shareholders. The bank has been distributing increasing dividends and repurchasing its shares resulting in a shareholder yield of more than 4.5%. Such a gain for a one of the highest-quality stocks in an environment of the low interest rates is extraordinary. Wells Fargo is certainly not a growth story stock; however, there is a high probability that holding to the share will be very beneficial for investors in the long term.

CONCLUSION

The investment recommendation and the whole analysis are based on the investment philosophy stemming from the teachings of Benjamin Graham and Warren Buffett. It consists of four key pillars – circle of competence, competitive advantage, management and value-price relationship. Investing as such may be performed only with a long-term investment horizon. Otherwise, investors simply rely on the emotional return, which is hardly predictable. The purpose of the second part of the first chapter was to introduce the reader into the theory of a bank business model, since a complete understanding of the analysed company is a cornerstone of the valuation. Additionally, regulatory framework was thoroughly investigated with a special attention to the implications on the bank's value. Dodd-Frank Act and BASEL III are the two most comprehensive and influential accords currently impacting the United States banking industry. For that reason, their examination was necessary.

The second chapter investigates into the bank valuation theory. Banks' business model and their operations differ significantly from a manufacturing company. Banks do not have clearly defined debt, which results in substantial difficulties when calculating weighted average cost of capital, net debt or free cash-flow to firm. Additionally, value is created among other things by liquidity transformation. Thus, working capital as a standard measure is rarely positive. Moreover, banks' capital expenditures are rarely significant since banking business is dependent on human capital rather than on property, plant & equipment. Recent trends suggest, however, that banks will invest heavily into intangible assets and capital expenditures are thus expected to become more important. In any case, it is necessary to understand the differences and apply appropriate techniques when valuing a financial services firm. The last theoretical chapter examines the importance of the cost of equity, definition of the metric and proposes an alternative calculation in contrast to traditional capital asset pricing model. The method is based on opportunity cost and considers long-term economic and demographic trends. Importantly, the technique does not equal risk and volatility. Margin of safety, firstly introduced by Benjamin Graham, is used instead.

The practical part of the thesis is focused specifically on Wells Fargo & Company and its competitive positioning, but also examines macroeconomic and industry trends. Federal Reserve has undertaken rate hikes, which ended an era of virtually zero-interest rate policy starting in 2009. Additional rate hikes are expected also in the future due to stability and great performance of the United States economy. Such a course of actions naturally benefits banks, since it eases pressure on net interest margins. Moreover, United States banking industry has been going through a consolidation phase with the number of operating banks falling every year. Nevertheless, even though further consolidation is expected, a large merger is highly unlikely due to regulatory requirements. In general, profitability of the industry has decreased after the financial crisis especially due to low interest rates and stricter regulation. The industry analysis using the five Porter's forces scheme is also incorporated in the chapter.

The subsequent section focuses on Wells Fargo & Co. specifically. The bank divides its operations into three basic segments – community banking, wholesale banking and wealth and investment

management. All the segments are briefly described, since comprehensive understanding is a cornerstone of a successful investment. Following part of the paper examines Wells Fargo's market share, which has expanded dramatically during the financial crisis mainly due to acquisition of Wachovia. Wells Fargo was very successful in overcoming the last financial crisis especially in comparison to other banks and boosted its reputation among public. The bank is widely regarded as an industry leader and as a result has been traded with a premium to its peers. The author has analysed competitive advantages, which the bank is thought to possess – low cost of funding, revenue diversification, lower regulatory requirements, competent management, extensive branch network and strong customer relationships. In general, the bank has been very successful in the past and still may be regarded superior. However, some competitive advantages have diminished in the current years such as revenue diversification or extensive branch network. Nevertheless, it's the bank's business model, which makes it superior. Wells Fargo is exposed mainly to consumer/commercial banking business and does not perform large trading operations. As proved by the BIS study, commercial banks have in the long-term higher and more stable profits in comparison to its trading and investment peers. Banks operate with high leverage. Therefore, stability and profitability in combination with management's clear intention to increase value for shareholders symbolize superior competitive advantage. The subsequent section researches into financials of the company and focuses on key drivers such as loan book growth, net revenue, credit quality, non-interest expense, capitalization, regulatory requirements and dividend policy.

Wells Fargo is attractively priced as calculated using both absolute and relative valuation models. Even though there is only 9% upside, the stock represents an investment opportunity for a long-term oriented investor.

Moreover, the price volatility the bank went through in the last year only strengthens the argument against the perfect market efficiency. Wells Fargo's market capitalization soared by outstanding $33 billion in just two days during November 2016. It is certainly difficult to argue that the stock had been priced fairly at every moment in the course of those days. Nevertheless, even though the price rose to $55.2 per share, the author believes that the company is still slightly undervalued. Furthermore, due to the appealing business model it is believed that there is an additional potential upside especially in the long-term.

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LIST OF EQUATIONS

LIST OF ABBREVIATIONS

AIG	American International Group
AT1	Additional Tier 1
AUM	Assets under management
BASEL II	International Convergence of Capital Measurement and Capital Standards
BASEL III	Third Basel Capital Accord
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlement
BoAML	Bank of America Merrill Lynch
CAGR	Compounded annual growth rate
Capex	Capital expenditures
CAPM	Capital asset pricing model
CC	Capital conservation
CDS	Credit default swap
CEO	Chief executive officer
CET1	Common Equity Tier 1
CFPB	Consumer Finance Protection Bureau
Citi	Citigroup
CoE	Cost of equity
DDM	Dividend discount model
DPS	Dividend per share
EBIT	Earnings before interest and taxes
EBITDA	Earnings before interest, taxes and depreciation and amortization
EMH	Efficient market hypothesis
ESOP	Employee stock ownership plan
ETF	Exchange-traded fund
EV	Enterprise value
FCFE	Free cash-flow to equity
FCFF	Free cash-flow to firm
FDIC	Federal Deposit Insurance Corporation
FED	Federal Reserve
FHLMC	The Federal Home Loan Mortgage Corporation
FNMA	The Federal National Mortgage Association
GDP	Gross domestic product
GNMA	Government National Mortgage Association
G-SIB	Globally systematically important bank
IBL	Interest-bearing liability
IEA	Interest-earning asset

IPO	Initial public offering
IRS	Interest rate spread
JPM	JPMorgan Chase & Co.
MoS	Margin of safety
NII	Net interest income
NIM	Net interest margin
NIM	Net interest margin
NPL	Non-performing loan
NPR	Net payout ratio
OCC	Office of the Comptroller of the Currency
OECD	Organisation for Economic Co-operation and Development
OTC	Over-the-counter
P/B	Price to book value
P/E	Price to earnings
P/TBV	Price to tangible book value
PCI	Purchased credit-impaired
PV	Present value
QE	Quantitative easing
RHS	Right-hand side
RI	Residual income
RoCE	Return on common equity
RoE	Return on equity
RWA	Risk-weighted asset
SEC	Securities Exchange Commission
SME	Small and medium enterprises
SPV	Special purpose vehicle
T1	Tier 1 Capital
TLAC	Total loss absorbing capacity
UK	United Kingdom
US	United States
WFC	Wells Fargo & Company
WIM	Wealth and investment management
WSJ	Wall Street Journal

APPENDICES

The diploma thesis is supplemented with a comprehensive financial model, which consists of several sheets listed below:

- **Inputs** – incorporates basic input data such as dates and minimum regulatory requirements
- **Summary** – summarizing sheet consisting of key ratios and metrics
- **Loans** – contains historical and modelling data regarding the loan portfolio
- **LLRs** – focused on cost of risk, loan loss provisions, charge-offs, recoveries and related ratios
- **Operating model** – complex sheet consisting of historical and forecasted financial statements
- **Capital** – contains key data regarding the regulatory capital and risk-weighted assets
- **Valuation** – incorporates valuation data and step-by-step valuation process
- **Peers** – contains figures related to Wells Fargo's peers such as beta, P/E and P/TBV etc.
- **Other** – the sheet comprises additional data used for financial modelling