

**CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE**

**Faculty of Economics and Management**

**Department of Economics**



**DIPLOMA THESIS**

**Estimation of Samsung stock fair value**

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**Diploma thesis supervisor: Ing. Petr Procházka, MSc, Ph.D.**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## DIPLOMA THESIS ASSIGNMENT

Bc. Tetyana Yarchak

Economics and Management

Thesis title

**Estimation of Samsung stock fair value**

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### Objectives of thesis

The main objective of the diploma thesis is to evaluate the efficiency of the financial and economic activity of Samsung Co., Ltd, as well as to characterize its properties and to determine financial position in the current market, especially for the stocks of company. The purpose is to appraise financials of Samsung such as profitability, price to earnings multiple, earnings per share, price/earnings growth ration, book value etc. Use appropriate method that is the most suitable for determining fair value of company. Define main competitors and compare its stocks, also to determine if a stock is overvalued or undervalued. A partial goal is to estimate market share of company on global market of smartphones, further to analyze past data in order to forecast the future price changes of Samsung stock and to use it for future prediction.

### Methodology

All information about Samsung Electronics Co., Ltd. is received from the annual financial statements of the company available on the website of company. The information for the fundamental economical analysis and technical analysis are gathered from the literature sources available in online library and other sources.

Literature review is conducted using methods of induction and deduction also synthesis and extraction. Analytical section will be made using methods of qualitative, analysis and quantitative as well, also mathematical and economic analysis will be used. All the mentioned methods above will be used for technical analysis of stock, measurement financial indicators such as different ration and comparison of Samsung stock with its main competitors.

All data calculated by different formulas for each specific indicator. All data of stocks for calculations are obtained mostly from internet source Yahoo.finance.com, Bloomberg.com and marketwatch.com. Time period for technical analysis was chosen December, 2010 – December, 2015 and for fundamental analysis was used data of annual company reports of fiscal years 2013 – 2015. All graphs and tables made by own computation in software Microsoft Office Excel 2010. Oscillators and Technical Indicators will be done using different methods available at online source investing.com.

Afterwards, by gathering all the information and analysing results there was done final conclusion, prediction of future position and the decision whether invest into a company was done using method of brainstorming.

**The proposed extent of the thesis**

60 pages

**Keywords**

Samsung Electronics Co., Ltd., economic analysis, stock, financial position, fair value, , dividend discount model, discounted cash flow model, price to earnings multiples, earnings per share approach, PEG ratio, overvalued, undervalued, investment recommendations.

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**Recommended information sources**

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- Graham, B. and Zweig, J. (2003). The intelligent investor. New York: HarperBusiness Essentials [u.a.], ISBN-10: 0060555661
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- Zyla, M. (2012). Fair value measurements. Hoboken, N.J: Wiley., ISBN: 978-1-118-22907-1
- 

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## DECLARATION

I hereby declare that I have worked on my Master Thesis titled “Estimation of Samsung stock fair value” solely and I have used the literature and sources listed in the bibliography.

In Prague, on 26 March, 2018

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Tetyana Yarchak

## ACKNOWLEDGEMENT

I would like to thank my supervisor Ing. Petr Procházka, MSc, Ph.D. for his expert suggestions, recommendations and assistance with my diploma thesis.

Further acknowledgment belongs to my parents for supporting me in all possible ways and for giving me the opportunity of university education.

**Estimation of Samsung stock fair value**

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**Odhad Samsung akciové reálná hodnota**

## **Summary**

The diploma thesis “Estimation of Samsung stock fair value” focuses on fundamental economic analysis through looking at chosen Korean company Samsung. The thesis is divided into two main parts: theoretical part together with literature review and the practical part of results and discussions.

The first part of diploma thesis is connected with the theoretical ground of analyzing the Korean stock market, stock analysis and methods of developing the theory of fundamental economic analysis. There are described types of stocks and their difference, as well there represent various types of models that are used to investigate the intrinsic value of Samsung stock.

In the practical part, there were used future stock valuation models such as dividend discount model, price to earnings multiples, discounted cash flow, etc. The analyzing of selected fair value models was done in order to determine if a company is overvalued or undervalued. The economic situation of the company will be represented as well. Subsequently, part of calculations focuses on the evaluation of financial statement of company Samsung.

The results of the analysis are used to predict the economic position of a company in a future year, as well as predict future share price and dividends. To determine if a company is profitable and financially stable and identify recommendations for potential investors whether they should invest or not in Samsung stocks.

## **Keywords**

Samsung Electronics, fundamental economic analysis, stock, financial position, fair value, dividend discount model, discounted cash flow model, price to earnings multiples, earnings per share approach, PEG ratio, overvalued, undervalued, investment recommendations.

## **Souhrn**

Tato Diplomová práce "Odhad Samsung akciové reálná hodnota" je zaměřen na fundamentální ekonomické analýze prostřednictvím pohledu na vybrán korejská společnost Samsung. Práce je rozdělena do dvou hlavních částí: teoretickou část spolu s literaturou a praktickou část.

První část diplomové práce je spojena s teoretickým důvodem analýzy korejském trhu cenných papírů, skladem analýzy a metod rozvoje teorie fundamentální ekonomické analýzy. Jsou zde popsány typy zásob a jejich rozdílu, jakož i tam představují různé typy finančních poměrech.

Praktická část se skládá z praktické vyjádření teoretické části společnosti Samsung Electronics. V této části tam byla provedena analýza hlavních finančních ukazatelů za účelem porovnání zásobu Samsung se svými hlavními konkurenty ve stejném průmyslu podle jejich ceny akcií a tržní kapitalizace. Ekonomická situace společnosti budou zastoupeny. Následně část výpočtů je zaměřena na zhodnocení účetní závěrky společnosti Samsung Electronics.

Výsledky z analýzy jsou použity k odhadu ekonomické postavení Samsung, pokud je ziskové a finančně stabilní a zformuluje doporučení pro potenciální investory, zda by měli investovat či nikoli do Samsung zásob.

## **Klíčová slova**

Samsung Electronics základní ekonomická analýza, akcie, finanční pozice, reálná hodnota, diskontní model diskontování, model diskontovaných peněžních toků, násobky výnosů, výnosy na akcii, poměr PEG, nadhodnocené, podhodnocené investiční doporučení.



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# 1. INTRODUCTION

In this thesis was chosen company Samsung a world leader in the production of semiconductor and telecommunications equipment, as well as in digital convergence technologies, in order to make economic analysis also for valuation of market position and to investigate stock. It is an established company almost all around the world. Besides company produces high-quality products and modern designs, which represents how the developed and innovative company is. With the success of its electronics business, Samsung has been recognized globally as an industry leader in technology and now ranks as a top 10 global brands. Samsung Group concludes numerous international affiliated businesses, such as Samsung Electronics, Samsung Corporation, Samsung Life, and Samsung Aviation and so on. Its business involved many areas of electronics, finance, mechanical, chemical, and others, which in the list of the world's top 500 enterprises.

In 1992 Samsung became the sole leader in the production of memory chips in the World and was second behind Intel in the chip-making industry. With a renewed focus on electronics, Samsung invested in LCD technology, becoming the largest manufacturer of LCD panels in the world by 2005. In 2009, the company took the position of the world's biggest IT maker, by surpassing the previous leaders. In 2011, its global enterprise market capitalization is up to \$150 billion. In 2012 Samsung's total revenue was nearly \$265 billion out of which it earned profits to the extent of \$26 billion, making Samsung the largest world's technology company in terms of revenues. The company employs 227,000 people across 75 countries with annual sales exceeding \$143 billion.

Nowadays, electronic products are loved by people and have become the trend of the necessities of life and the pursuit of goods. In the face of fierce competition and huge market potential of the electronic industry, the major foreign manufacturers and domestic manufactures both want to occupy the leading position in the market, grab market share. In this period with opportunities and challenges, how to enable an enterprise to be invisible is an important problem that every electronic enterprise explored actively. The smartphone industry is dominated by Samsung and Apple, that took together 88.1 percent of the \$215 billion profit that was generated in this industry over the last six years. Comparing these two leaders, Samsung stood at 26.1 percent, while Apple alone took away around 62 percent of profits, which makes Apple the main competitor of Samsung.

## **2. OBJECTIVES AND METHODOLOGY**

### **2.1 Objectives and aims**

The main objective of the diploma thesis is to evaluate the efficiency of the financial and economic activity of Samsung, as well as to characterize its properties and to determine the financial position in the current market, especially for the stocks of a company.

The purpose is to appraise financials of Samsung such as profitability, price to earnings multiple, earnings per share, price/earnings growth ration, book value etc. Use an appropriate method that is the most suitable for determining the fair value of a company. Define main competitors and compare its stocks, also to determine if a stock is overvalued or undervalued.

A partial goal is to estimate the market share of a company on the global market of smartphones, further to analyze past data in order to forecast the future price changes of Samsung stock and to use it for future prediction.

### **2.2 Methodology**

All information about Samsung is received from the annual financial statements available on the website of the company. The information for the fundamental economic analysis and technical analysis are gathered from the literature sources available in the online library and other sources.

A literature review is conducted using methods of induction and deduction also synthesis and extraction. The analytical section will be made using methods of qualitative, analysis and quantitative as well, also mathematical and economic analysis will be used. Method of comparison will be used in order to compare company Samsung with its main competitors in the same industry – Apple, Huawei, Oppo, Vivo, etc. For stock valuation, there were used different models, that were determining if a company is overpriced or underpriced. The main valuation models to determine the fair value of the company are: dividend discount model, includes itself constant-growth model and variable growth model, price to earnings multiples, capital asset pricing model, earnings per share approach, peg ratio, discounted cash flow model and book value.

The data were calculated by different formulas for each specific model. Data of stocks for calculations are obtained mostly from an internet source: yahoo finance, Bloomberg, Morningstar, MarketWatch, etc. A time period for technical analysis was

chosen January 2000 – January 2017 and for fundamental analysis was used data of annual company reports of fiscal years 2000 – 2017 as well. There was done expectation of dividends and share price. The prediction of future value was done for next three years, for 2018, 2019 and 2020. All graphs, tables, figures were made by own computation in software Microsoft Office Excel 2016.

Afterwards, by gathering all the information and analyzing results there was done final conclusion, prediction of future position and the decision whether invest in a company or not, using a method of brainstorming.

### **3. THEORETICAL PART AND LITERATURE REVIEW**

#### **3.1 Concept of stock**

##### **3.1.1 Definition of stock**

An equity investment is a stock. In other words, it is a representation of required on part of company's assets and earnings, as well it is kind of security that indicate ownership in a company.<sup>1</sup>

##### **The ownership nature of stock**

The capital stock of a company's entity performs the individual capital paid-up into or invested in the enterprises by its creators. It maintains as a security for the creditors of a enterprises since it cannot be enclosed to the harm of the creditors. Stock is another from the feature and assets of an enterprises, one and the other of which may hesitate in amount and value. Stock of an enterprises is valued accordingly to trading demand and general enterprise health and its value will change over time. Control of stock performs a share of ownership in the enterprise organization. The stock is a safeness that performs equity in the company.

Property of shares is documented by emission of a stock certification. A stock certification is a legitimate document that indicate the number of shares hold by the stockholder. It also indicates different phases of the shares such as the par value of the shares. Another certificate will point out what rights turn up with property of specific classes of stock.

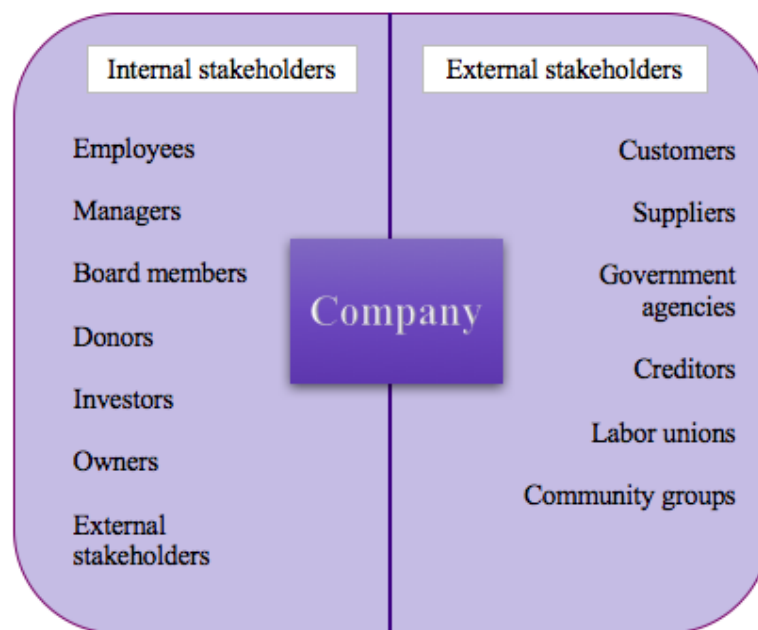
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<sup>1</sup> Staff, I. (2017). Stock. [online] Investopedia. Available at: <https://www.investopedia.com/terms/s/stock.asp#ixzz4yUK8FMAI> [Accessed 5 Sep. 2017].

### 3.1.2 Stakeholders

A shareholder or stockholder is person or establishment (including a organization) that legitimately is an owner of stock in a public or personal organization. Stockholders or shareholders are taken into consideration by some to be a subset of stakeholders, that can which may involve anybody that has a straightforward or not direct concern in the enterprise entity. As an illustration can be: labor, suppliers, customers and the society are characteristically considered shareholders, as they facilitate value or they are pressed by the organization.<sup>2</sup>

**Figure 1: Internal and External stakeholders**



*Source: own processing, data from: Searchcio.techtarget: stakeholder, 2017*

### Rights of Stockholders

Shareholders are provided exclusive prerogative that depends the class of stock. These privileges consist from:

- Shares can be sold
- Can vote for director that is proposed by the board
- Can propose the director and can offer stakeholder resolutions
- Privileges on dividends when the announced
- Acquisition of new stock issued by the corporation

<sup>2</sup> SearchCIO. (2017). What is stakeholder? - Definition from WhatIs.com. [online] Available at: <http://searchcio.techtarget.com/definition/stakeholder> [Accessed 10 Sep. 2017].

- Decision on what assets keep after the dissolution

Holders of common and preferred shares in general have to wait till debt-holders will get assets beyond insolvency in order to see any assets after dropping-out from the business.<sup>3</sup>

### **Control and Preemption**

Controlling and preferential right of purchase are specific shareholder rights. A preferential right of purchase right, is a treaty right to buy specific estate coming into essence until it can be suggested to any other organization or person. This right is often appositional for stockholders of an enterprise as they are generally proposed the first chance to buy new issued stock before it became accessible to the society. Whereas stakeholders are suggested the variant of early acquisition, they do not obligatorily have to take it. The stimulus to exercise this variant is based on the wish to defend particular ownership or stake in an organization from breeding. Options of preferential right of purchase will differ from corporation to corporation and stock type to stock type.<sup>4</sup>

### **3.1.3 Types of stocks**

#### **Common Stock**

Common stock is a shape of property and equity, that differs from preferred stock, that yet makes authority of ownership for its stakeholders. Common stock is a kind of corporate equity property, which is a form of security. In some parts of the world there used terms such as: “ordinary share” or “voting share”. In the U.S. there is used first of all term “Common stock”. In order to differ it from preferred stock, it is called “common. In case if first and second type of stock exist, then holder of common stock can’t be paid-up dividends before all preferred stock dividends, included payments in all spheres are paid in full.

When insolvency become, common stock holders obtain any remaining funds after the holders of bonds, preferred shareholders as well creditors inclusive employees. In case of liquidation of corporation, these stakeholders do not receive anything.

In that time as holders of common stock are on the whole are at the end in the line of all creditors to get assets should the corporation in matter go bankrupt, the preferred shares are working worst then common shares over time. As well, ordinary shares often

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<sup>3</sup> US Legal, I. (2017). Shareholder Rights – Corporations. [online] Corporations.uslegal.com. Available at: <https://corporations.uslegal.com/shareholder-rights/> [Accessed 10 Sep. 2017].

<sup>4</sup> Elibrary.law.psu.edu. (2017). Cite a Website - Cite This For Me. [online] Available at: [http://elibrary.law.psu.edu/cgi/viewcontent.cgi?article=1279&context=fac\\_works](http://elibrary.law.psu.edu/cgi/viewcontent.cgi?article=1279&context=fac_works) [Accessed 25 Sep. 2017].

bring the right to vote on specific issues. These issues include itself, in the time when they are not being not restricted, the decision on who will sit on the company's board of directors. Nevertheless, the company may have together with “non-voting” and a "voting" class of ordinary shares. Ordinary shareholders do not receive assured dividends, so their yield may be unsure. It should be remembered that preferred shares usually do not have the right to vote.

The common stock holders have power to influence company across voting on strengthen company aims and policy, as well as splits of stock and nominate the corporation’s board of directors. Also, some stockholders obtain preferential right of purchase, that allow them to restrain their proportion of ownership in corporation should it issue other stock proposals.<sup>5</sup>

### **Preferred Stock**

Preferred shares usually have voting rights, but they can bear dividends, take precedence over ordinary shares in liquidation or have other advantages. Preference shares (also called preferred stock, or simply preferred ones) are equity instruments with the conditions of both equity and debt tool and is usually elaborate as hybrid tool. It is the major (i.e., higher rated) common stock, but is subject to bonds in terms of requires (or rights to their share in the company's assets). By other words, in the event of dissolution or bankruptcy of the corporation, preferred shares will qualify for assets before ordinary shares, but after corporate bonds or other debt tools.

Preferred shares usually do not have voting rights, but they can bear dividends and may take precedence over ordinary shares in the payment of dividends and in liquidation of corporation. Specific conditions for owning preferred shares are indicated in the certificate of appointment. The functions and rights normally connected with preferred shares as following:

- Preference in dividends
- Preference in assets in case of liquidation
- Alterability into ordinary shares
- Ability to call, at the choice of the company
- Rights without the right to vote

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<sup>5</sup> Arbor Asset Allocation Model Portfolio (AAAMP) Value Blog. (2017). What is Common Stock? Advantages and Risk - Arbor Asset Allocation Model Portfolio (AAAMP) Value Blog. [online] Available at: <http://www.arborinvestmentplanner.com/common-stock-advantages-risk-2/> [Accessed 15 Sep. 2017].



Like bonds, preferred shares are valued by the largest credit rating corporations. The assessment of preferred shares is often lower, since preferred dividends are not carrying the same warranty as interest payments on bonds, and they are the lowest for all creditors. Details regarding the rights associated with preferred shares will change depending on the corporation's entity issuing shares, and preferred shares may be received in different classes. An example can be: prior preferred preference shares, preferred shares, preferred convertible shares, cumulative preferred shares, monthly income preferred shares and non-cumulative preferred shares.<sup>6</sup>

### **3.1.3 Exchange of stocks, volatility and market price**

#### **Exchange of stocks**

The stock exchange is a format of exchange, that contributes services to stock brokers and traders for trading in stocks, securities and other bonds. Stock exchanges also supply funds for the issue and buyout of securities and other financial tools, as well as capital events, inclusive the payment of income and dividends. Securities traded on the stock exchange inclusive shares issued by corporations, mutual funds, derivatives, combined investment bonds and production.<sup>7</sup>

#### **Stock volatility**

Stock prices are constantly hesitating. This is due to the fact that the demand for shares is changing. As more and more shares changing hands, the price of its shares changes more.

This is called stock volatility. Even the level of volatility in the market changes daily. To determine this volatility, the National Stock Exchange provide the index of VIX India, also called the indicator of fear gauge. VIX is also used as a detector of the trends in stock prices. This is due to the fact that VIX is growing when more fear and indeterminacy appear on the market. This signify that investors take an increased risk. In the market, this often follows a fall.<sup>8</sup>

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<sup>6</sup> Courses.lumenlearning.com. (2017). Types of Stock | Boundless Finance. [online] Available at: <https://courses.lumenlearning.com/boundless-finance/chapter/types-of-stock/> [Accessed 25 Sep. 2017].

<sup>7</sup> Stocks. Exchange. (2017). Stocks. Exchange - invest worldwide. [online] Available at: <https://stocks.exchange> [Accessed 25 Sep. 2017].

<sup>8</sup> Kotaksecurities.com. (2017). Basic Stock Market Related Concepts | Kotak Securities®. [online] Available at: <https://www.kotaksecurities.com/ksweb/Research/Investment-Knowledge-Bank/share-market-related-concepts> [Accessed 25 Sep. 2017].

## **Market price**

The market price of a share is the price that it sells on the open market at a given time. The market price often will change during the day of trading, in that time when investors are going buy and sell shares. The more people want to buy shares, the more will grow market price and vice versa the more people wanted to sell shares, the market price will fall down. The represented in the stock quotes refers to the market price.<sup>9</sup>

## **3.2 Types of Stock Market Analysis**

### **3.2.1 Fundamental analysis**

A method for determine companies that affect testing of their financial positions and real activities. The beginning for fundamental analysis is that the value of a company is the discounted value of the future flow of profits that will produce it. Fundamental analysis, later takes data into account on assets, earnings, growth, competitors, products management, debts and also to predict profits in future. Fundamental analysis is established on the classical study of supply and demand factors that motive market prices to increase or decrease. In financial markets, the fundamentalist would attention at such things as trade deficits, corporate earnings and changes in the money supply. The purpose of this approach is to arrive at an estimate of the intrinsic value of a market in order to define if the market is over- or under-valued.<sup>10</sup>

### **3.2.2 Technical analysis**

The usage of past data on security prices to predict future security prices, usually by using charts to present patterns in prices. Marketers using technical analysis are occasionally referred to chartists. Against its use being fairly common, technical analysis has limited empirical excuse: the patterns that have been found cannot be abuse profitability once trading costs are taken into account.<sup>3</sup> As well it is study of market process and price charts that are using, to forecast future price direction. The cornerstone of the technical philosophy is the assumption that all of the factors that affect market price — political events, natural disasters, fundamental importance, and psychological factors —

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<sup>9</sup> Finance.zacks.com. (2017). What Is Meant by the Market Price of a Stock?. [online] Available at: <https://finance.zacks.com/meant-market-price-stock-5731.html> [Accessed 25 Sep. 2017].

<sup>10</sup> Home, D., News, M., News, R., Briefings, D., Alerts, M., Authors, D., Picks, A., Resistance, S., Reports, D., Points, P., Trading, A., Bank&nbsp;Rates, C., Guides, F. and PLUS, D. (2017). How to Combine Technical and Fundamental Analysis. [online] Dailyfx.com. Available at: [https://www.dailyfx.com/forex/education/trading\\_tips/daily\\_trading\\_lesson/2012/07/18/How\\_to\\_Combine\\_Technical\\_and\\_Fundamental.html](https://www.dailyfx.com/forex/education/trading_tips/daily_trading_lesson/2012/07/18/How_to_Combine_Technical_and_Fundamental.html) [Accessed 26 Sep. 2017].

can be discounted fast in market activity. By different words, the impact of these external factors will quickly show up in some form of price movement, either up or down.<sup>11</sup>

### 3.2.3 Sentimental analysis

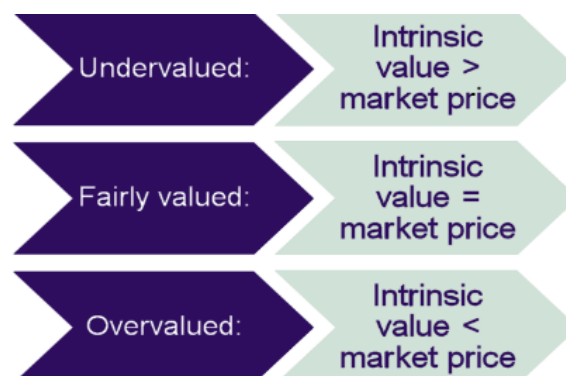
Sentimental analysis tries to determine the market in terms of investor relations. Sentimental analysis is based on the hypothesis that most of investors are not right. By other words, the stock market may disappoint when "a lot of investors" suppose that prices are moving in a certain direction. Sentiment analysts are often referred to as opposing, who seek to invest against most views on the market. For example, if most professional experts of market believe that there will be rise in the share price, the analysts of the senses may seek prices in order to disappoint the majority and the trend below.

## 3.3 Value of stock

### 3.3.1 Intrinsic Value

The actual value of a firm or an asset established on an underlying feeling of its true value inclusive of possibilities of the business, in terms of both tangible and intangible factors. This value can be the same, but in same way it can be not the same as the current market value. Investors using value a plenty of analytical techniques for the sake of estimation the intrinsic value of securities in hope to find investments where the true value of the investment overtakes its current market value.<sup>14</sup>

**Figure 2: Estimated Value and Market Price**



Source: own processing, data from: *Equity Valuation: Concepts and Basic Tools*, 2017

<sup>11</sup> Appelmanfinancial.com. (2017). Cite a Website - Cite This For Me. [online] Available at: <http://www.appelmanfinancial.com/resource-center/investment/types-of-stock-market-analysis> [Accessed 28 Sep. 2017].

<sup>14</sup> INVESTOPEDIA, (2003). *Intrinsic Value Definition / Investopedia*. [online] Available at: <http://www.investopedia.com/terms/i/intrinsicvalue.asp> [Accessed 12 Sep. 2014].

Stocks have intrinsic value; thus, they present partial ownership of a being with the power to earn money and finally distribute it as dividends. For real estate intrinsic value, can charge a rental fee.<sup>15</sup>

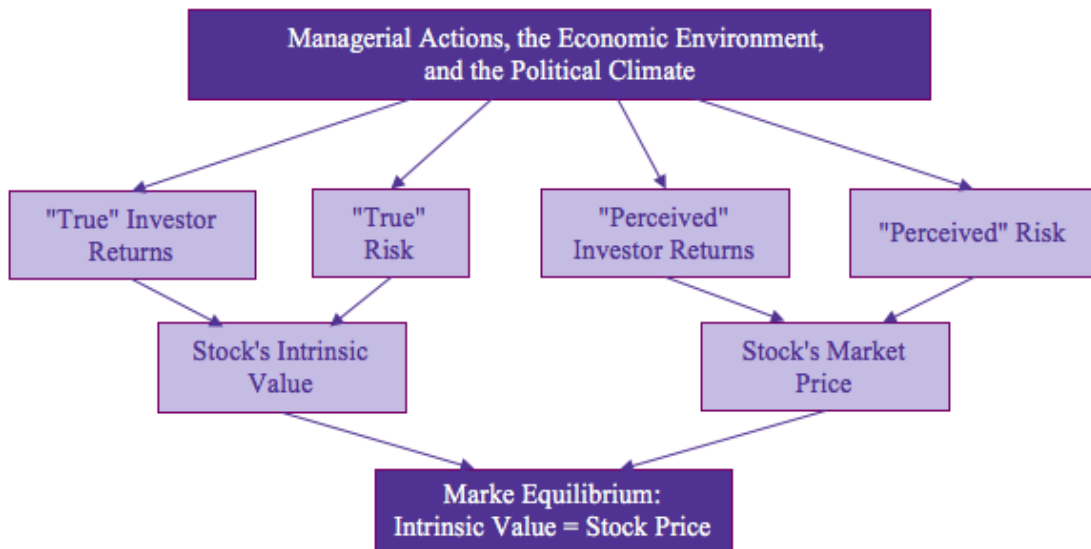
### 3.3.2 Extrinsic Value

The difference among an options intrinsic value and market price. In theory, options should not trade above their intrinsic value due to the time value associated with option pricing. Extrinsic value as well the portion of an item's purchase that is assigned to it by external factors. And intrinsic value is the opposite of extrinsic value, which is the inherent worth of an item.<sup>16</sup>

### 3.3.3 Future Stock Value

There are many different ways to assess the future value of shares, inclusive fundamental criterion and methods for estimating stock. In financial markets, the valuation of stocks includes the calculation of the speculative values of stocks and its corporations. The primary use for valuation of stock is to forecast future market prices and income from changes in prices.

**Figure 3: Determinants of Intrinsic Value and Stock Prices**



Source: own processing, data from: *Stocks and Their Valuation*, 2017

<sup>15</sup> MURCKO, T., (2015). *The Intrinsic Value of Stocks, Real Estate, and Precious Metals*. [online] Investorwords.com. Available at: <http://www.investorwords.com/tips/1260/the-intrinsic-value-of-stocks-real-estate-and-precious-metals.html> [Accessed 13 Sep. 2014].

<sup>16</sup> INVESTOPEDIA, (2003). *Extrinsic Value Definition* / Investopedia. [online] Available at: <http://www.investopedia.com/terms/e/extrinsicvalue.asp> [Accessed 18 Jun. 2014].

Stocks that are determined as undervalued (relative to their theoretical value) are bought, and stocks that are considered overvalued are sold in anticipation that the undervalued reserves will generally grow, while the overvalued reserves will generally fall.

## **3.4 Dividends**

### **3.4.1 Definition of dividend**

A dividend is defined as a corporate payment to shareholders. Typically, these payments are made in cash (called "cash dividends"), but occasionally companies also distribute dividend shares, with help of additional shares are distributed among shareholders. Stock dividends are as well referred to as retail shares.

### **3.4.2 Cash Dividends**

Cash dividends are usually paid to stockholders four times a year, or each quarter. Nonetheless, some firms pay dividends even monthly (12 times a year), six months (twice a year), or annually (once a year). Every firm/corporation define the dividend payment dates on which dividends will be paid and plan its own payout schedule. Some corporations even so often pay special one-time dividends. These special benefits are separated from regular corporation payments and do not form part of stock's dividend yield.

At any time, it is possible to change dividend policy, as not all companies are paying dividends. More and more companies are starting new dividends and increasing dividends that already exist, as investors are becoming hungrier.

### **3.4.3 Dividends payed by companies**

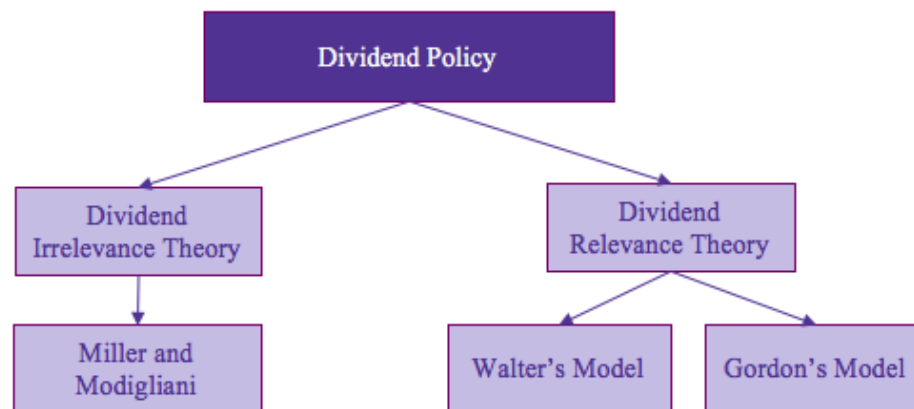
Companies sell stock shares to the public to raise money, which they then use to fund existing operations and expand their businesses. In essence, a dividend is a reward given to shareholders for owning stock in the corporation. So, dividends are a key way for companies to attract investors to buy their stock.

In order to rise money, companies sell shares to the public, which they then use to enlarge their business and finance existing operations. In nature, dividends are a reward given to stockholders to hold shares in a business. So that, the main key way of companies is to attract investors to buy their shares.<sup>12</sup>

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<sup>12</sup> O., Brien, S., Sharma, A., Levitt, A. and Sharma, A. (2018). What is a Dividend? [online] Dividend.com. Available at: <http://www.dividend.com/dividend-investing-101/what-is-a-dividend/> [Accessed 20 Dec. 2017].

**Figure 4: Dividend Policy**



*Source: own processing, data from: Business Jargons, 2017*

### **3.5 Stock Valuation Methods**

There are many ways to estimate stocks. The key is to take into account each approach when making a general opinion about the stock. If the company's valuation is lower or higher than another same share/stock, the next step will be determining the causes of the discrepancy. Investors conduct stock valuation when making investment decisions. They sell their stocks of stocks that they review to be overvalued and glance through investments in undervalued stocks. There are lot of stock valuation methods, which are described below.<sup>13</sup>

#### **3.5.1 Dividend discount model**

In the model of dividend discounts are used 3 models:

- Zero growth, which assumes that all dividends paid by shares remain unchanged;
- Model of constant growth, which suggests that dividends grow at a certain percentage annually;
- Variable growth model, which usually distributes growth in 3 stages: a fast-initial phase, then a slower transition phase, which ultimately ends up at a lower rate that is stable over a long period.

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<sup>13</sup> Hunting Value. (2017). Stock valuation methods - Hunting Value. [online] Available at: <http://www.huntingvalue.com/stock-valuation/stock-valuation-methods/> [Accessed 29 Sep. 2017].

### **Constant-growth model**

The dividend discount model is taken into account at a discounted amount of all future dividends and does not take into account assets or income.

The dividend discounting model (DDM) is a process of estimating a corporation based on the theorem that it is worth the discounted amount of all future dividend payments. By other words, it is used to estimate shares based on the net present value of future dividends. Gordon's growth model, the second name of this approach. "It is named after Myron J. Gordon, who was originally published in 1959, although the theoretical basis was provided by John Berry Williams in his 1938 text "The Theory of Investment Value".

#### **Formula:**

$$P = \frac{D1}{r - g}$$

#### **The variables and equation are:**

- P is the current stock price
- g is the constant growth rate in perpetuity expected for the dividends
- r is the constant cost of equity for that company
- D1 is the value of the next year's dividends
- There is no reason to use the calculation of dividends for the next year using current dividends and growth rates, when management usually disclose dividends in the coming year, and websites publish it
- A dividend should be paid on a regular basis
- Growth rate in the dividends is constant
- Required return should be greater than growth rate:  $r > g$

#### **Income plus capital gains equals total return:**

The model can also be understood to produce a stock value, so that the amount of its dividend yield (income) plus its growth (capital gain) is equal to the required total profit of the investor. Taking into consideration the dividend growth rate as an indicator of profit growth and an increase in the share price and capital gains. If take into account the cost of the company's equity as a proxy for the required total profit of the investor.

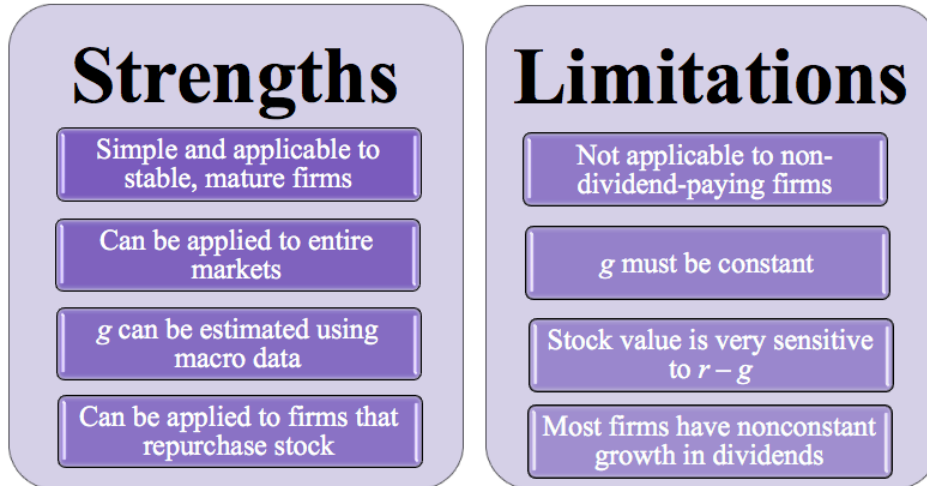
#### **Formula:**

$$r = \frac{D}{P} + g \quad \Rightarrow \quad \frac{D}{P} = r - g \quad \Rightarrow \quad P = \frac{D}{(r - g)}$$

$$\text{Income} + \text{Capital Gain} = \text{Total Return}$$

$$\text{Dividend Yield} + \text{Growth} = \text{Cost of Equity}$$

**Figure 5: Issues using the Gordon Growth Model**



Source: own processing, data from: *Discounted Dividend Valuation, 2017*

**The strengths of the Gordon growth model:**

- Simple to accept and exercise to resistant, mature firms with a steady increase in dividends.
- This can be used to evaluate a single stock market, using data for the entire stock market. Estimation using  $g = \text{nominal GDP (gross domestic product)}$ , can be used in the  $g$ , the growth rate of dividends, that is the sum of long-term inflation and real GDP growth. As well there is rule that the GDP growth rate should be much smaller than estimated long-term dividend growth rates because the company's growth cannot greatly prevail the economy's over the long term.
- The Gordon Growth Model can be applicable to companies that pay dividends and repurchase shares if the analyst predicts dividends on stocks that present or reflect the number of shares that will be redeemed over time. But, companies are not obliged to redeem policies in the way they pursue dividend policies; therefore, foreclosure is difficult.

**The limitations of the Gordon growth model:**

- Model can't be safely applied to companies without a dividend history, since forecasting of future dividends becomes more and more complex. Dividends should also have a permanent relationship with the company's revenues.



- Model supposes that constant in the model is the growth rate of dividends, therefore it can't be applicable to companies with different rates of future growth of dividends. Besides recall, that the model supposes that the required return on equity or (r) exceeds the growth rate of dividends.
- Estimated value of shares is very sensitive to denominator  $r - g$ . If there is increasing or decreasing by only 1% of denominator, for example, there will be change in estimated valuations at a high monetary value. Because of this reason, there should be conducted a sensitivity analysis by analyst, where shares are valued at different required percentages and growth rates.
- Much, apparently, most firms have a steady growth in future dividends, so the Gordon growth model can't be directly applied. For these firms, it is needed to use multi-stage models<sup>14</sup>

### Variable-growth model

The growth rate of dividends can be changed by the variable of growth model, which is a dividend approach. For determining the share of stock, model can be divided into four-step procedure. The value of stock can be defined as in following steps. There is an assumption that  $g =$  initial growth rate then  $g =$  the subsequent growth rate occurs at the end of year N.

**Step 1:** There is need to calculate the value of cash dividends at the end of each year (D) during the first growth period (years 1 - N).

**Formula:**

$$D_t = D_0 * (1 + g) = D_0 * PVIFt$$

**Step 2:** Then there should be done computation of the present value of the dividends expected during the initial growth period

**Formula:**

$$PV \text{ of price of dividends} = \sum_{t=1}^n \frac{D_0 * (1 + g)^t}{(1 + r_s)^t} = \sum_{t=1}^n \frac{D_t}{(1 + r_s)^t}$$

**Step 3:** Afterwards there should be done foundation of the value of the stock at the end of the initial growth year. This is the current value of all dividends expected from N + 1 year,

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<sup>14</sup> Corporate Finance Institute. (2017). Gordon Growth Model - Guide, Formula, Examples and More. [online] Available at: <https://corporatefinanceinstitute.com/resources/knowledge/valuation/gordon-growth-model/> [Accessed 30 Sep. 2017].

taking into account the constant growth of dividends. Then  $g$  - is the present value of  $p$  will present the today value of all dividends expected from year  $N + 1$  to uncertainty.

**Formula:**

$$PV \text{ of price of stock} = \frac{1}{(1 + r_s)^n} * \frac{D_n + 1}{r_s - g}$$

**Step 4:** And finally add the components of the present value that were found in the second and third steps in order to find the value of the stock –  $P$ .

**Formula:**

$$P_0 = \sum_{t=1}^n \frac{D_0 * (1 + g)^t}{(1 + r_s)^t} + \left( \frac{1}{(1 + r_s)^n} * \frac{D_{n+1}}{r_s - g} \right)$$

where:

$$\left. \sum_{t=1}^n \frac{D_0 * (1 + g)^t}{(1 + r_s)^t} \right\} PV \text{ of price of dividends during the initial growth period}$$

$$\left( \frac{1}{(1 + r_s)^n} * \frac{D_{n+1}}{r_s - g} \right) \left. \right\} PV \text{ of price of stock at the end of the growth period}^{15}$$

### 3.5.2 Key factors of stock valuation models

#### Required Rate of Return

It is essential to balance the investor for the risk associated with the investment. The required rate of return is one of the most important One of the main sections of the stock valuation. In general, the amount of profit compulsory by the investor should be related to the level of risk that should be accepted for such profits. Essentially, the required returns set offset that is reconcilable with the amount of risk. This standard will help to identify if the expected return on stock (or any other security) is pleasant. As it is unknown what the cash flow of an investment will be, there should be an expectation to earn a rate of return that reflects this uncertainty. Therefore, the higher expectation to earn then the greater is the perceived risk.

Required return can be found through capital asset pricing model (CAPM).

#### Capital asset pricing model (CAPM)

This model focuses on asset sensibility to non-diversified risk (as well it is known as systemic risk or market risk), usual expressed by the value of beta ( $\beta$ ) in the financial

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<sup>15</sup> Graham, B. and Zweig, J. (2003). The intelligent investor. New York: HarperBusiness Essentials [u.a.], ISBN-10: 0060555661

sector, also as the expected return of the theoretical asset without risk and expected market returns. CAPM provides a special form of useful functions (in which only the first and second points are important, that is the risk measured by the variance, for example quadratic utility) or zero transaction costs (needed for diversification to dismiss all idiosyncratic risks) and alternatively asset recovery probability distribution, which is fully represented by the first two points (normal distribution).

Capital asset pricing model demonstrate that the cost of equity is defined only by the beta. Despite the lack of multitudinous empirical experiments and the availability of more neoteric approaches to asset pricing and portfolio selection (for example, Merton's portfolio and the theory of arbitrage pricing), model continues to be popular due to its simple usage in various situations.

**Formula:**

$$K_e = R_f + (K_m - R_f)B_e$$

$K_e$  ... is the expected return on asset e or cost of equity if the asset is equity

$R_f$  ... is the nominal risk-free rate of return

$K_m$  ... is the expected return on the market portfolio

$(K_m - R_f)$  ... is often called the expected market risk premium ["MRP"] being the amount by which investors will be rewarded for bearing the risk of the market portfolio which has a beta of 1

$B_e$ ... is the risk of asset e relative to the risk of the market or equity beta.

**Beta ( $\beta$ )**

Not direct measure that making comparison of systemic risk associated with company stocks with a systematic risk in the capital market as a whole refers to beta. The systemic risk consolidated with the stock is similar to the systematic risk in the capital market in total, in case when the beta price of the company's shares is equal to 1. Besides, beta can be defined as "the index of earnings sensitivity of a company's shares in comparison with market revenues in general". An illustration can be example, beta equal to 1, then the profitability of the stock will increase by 10% in case when the return on the capital market in general will grow by 10% as well. But if a share has a beta value of 0.5, the return on the share will increase only by 5%, in case when the return on the capital

market growing by 10%. The values of beta are determined by a regression analysis in order to compare earnings per share with income in the capital market.<sup>16</sup>

### **Risk free rate**

In the real world, the risk-free rate of return is no such thing as a risk-free asset. However, short-term government debt is a comparably more secure investment, and in tradition it can be used as a congruent replacement for the risk-free. Since the Capital asset pricing model is suitable within a certain financial system, the risk-free rate of return (yield on short-term public debt) varies relying on which country considers the capital market. As well risk-free rate of return not fixed, but it depends on the change of economic conditions.

### **Equity risk premium**

The difference between the risk-free rate of return and average return on capital is called equity risk premium. As long as it expresses the additional profit that is necessary to invest in equity (shares in the capital market in general) rather than investing in risk-free assets. In the short run, stock prices may increase or decrease, thus the average return on capital market can be both positive and negative. In order to smooth out short-term fluctuations in equity risk premium, the analysis of a smoothed moving average can be implemented a long period of time, usually several decades.<sup>17</sup>

### **Market rate of return**

The extra profit received by the investor for carrying out a risky market portfolio, rather than risk-free assets, is called a market risk premium. Capital asset pricing model is used by investors and experts in order to calculate an acceptable rate of return. A market risk premium is an integral part of this CAPM.

### **Present Value Interest Factor**

The present value or value of today, of a range of payments or a separate payment that will be obtained later, provided at the specified discount rate. The proceedings of defining the discounted value of a future payment or a range of payments or receipts is called discount.

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<sup>16</sup> GITMAN, L.J., (2006). Principles of Managerial Finance. 11th ed. United States of America: Pearson Education, Inc. ISBN 0-321-31150-7

<sup>17</sup> Accaglobal.com, A. (2018). The capital asset pricing model – part 1 | F9 Financial Management | ACCA Qualification | Students | ACCA Global. [online] Accaglobal.com. Available at: <http://www.accaglobal.com/gb/en/student/exam-support-resources/fundamentals-exams-study-resources/f9/technical-articles/capm-part1.html> [Accessed 15 Dec. 2017].

**Formula:**

$$PV = FV / (1 + r)^n$$

PV ... present value or the principal amount

FV ... future value of the initial principal n years hence

r ... rate of interest per annum

n ... number of years for which the amount has been invested

In overall terms, the discount is the contraposition of the composition. This is the procedure of calculating the value of money indicated on the future date in terms of today.

For transformation of the interest rate money indicated on the future date to date is well-known as the discount rate.

**Formula:**

$$PVIF = \frac{1}{(1 + i)^n}$$

i ... percentage rate

n ... period<sup>18</sup>

**3.5.3 Price to earnings multiples approach**

The price to earnings multiples makes a comparison of the earnings per share, which the company reports, to the market price of its ordinary shares. Investors are using this multiple instrument to estimate how much the share of a company's stock is. When a market falls, the general rate P/E multiples turn to decrease for shares of all firms, and vice versa when happens the dilative of economy.

Investors turn to increase stock prices, which growing the price to earnings multiple when higher returns are expected in the future, alike if the issuer does not yet report growth in earnings per share. This can happen when a promising new good or service is produced or reported. A multiple can also grow when registered earnings per share prevail analysts' expectations. Vice versa, the multiple is likely to refuse under any of the next conditions:

- Business announces disappointing earnings
- A competitor produces a good that will immediately rival with the goods of the firm
- Reduced trade barriers with another country, which increases the risk of price rival

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<sup>18</sup> EFinanceManagement.com. (2018). What is Market Risk Premium ? | Market Risk Premium Formula. [online] Available at: <https://efinancemanagement.com/investment-decisions/market-risk-premium> [Accessed 9 Dec. 2017].

- The litigation with a potentially large disbursement has been filed contrary to the firm

**Formula:**

$$P/E = \frac{\text{Share Price}}{\text{Earning Per Share}}$$

Understanding of what establishes a "fair range" of multiple earnings for stocks, with regard to expected growth and stability, permits an investor to determine some scenarios share prices in future. This model can be as an alternative to discounted cash flow model, also can be used regardless of whether the firm pays dividends.<sup>19</sup>

**3.5.4 Earnings per share approach**

Net income per share as well called earnings per share (EPS). It is a market outlook that defines the number of net income earned per share of outstanding stock. Also, each share will receive the amount of money if all the profits were allocated to the issued shares at the end of the year.

In addition, earnings per share is estimation that point out how profitable the firm is on a stock basis. Thus, the greater firm's profit per stock share can be compared to a smaller firm's profit per stock share. Evidently, this estimation strongly affects the number of outstanding shares. Thus, a bigger firm will have to distribute earnings between an even larger number of shares than a smaller company.

**Formula:**

$$EPS = \frac{\text{Earnings}}{\text{Total Shares Outstanding}} = \frac{\text{Net Income} - \text{Prefered Dividends}}{\text{Total Shares Outstanding}}$$

Earnings per share is estimated by subtracting preferred dividends from net income and dividing by the total common shares outstanding.<sup>20</sup>

**3.5.5 Price to earnings to growth ratio**

In order to compare the relative value of shares on earnings basis is used price to earnings (P/E). It is calculated by adopting the current value of the shares and its distribution by earnings per share (EPS). This estimation shows if the share price is low or high compared to its earnings, and gives an idea of how big the market value of the firm's earnings.

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<sup>19</sup> Graham, B., Dodd, D. and Buffett, W. (2009). Security analysis. 6th ed. New York: McGraw-Hill., ISBN-10: 0071592539

<sup>20</sup> Shim, J. (2012). Time value of money and fair value accounting. Kent: Global Professional Publishing Ltd., ISBN-10: 1906403767

**Formula:**

$$PEG = \frac{\text{Price to earnings ratio}}{\text{Growth Rate}(EPS)}$$

**The meaning of the high price to earnings**

- The firm with high P/E is overpriced, on opinion of some investors, and they may be correct.
- A high price to earnings may be a sign that brokers pushing stock prices up to the point where any acceptable near-term increase is possible.
- On the other hand, a high price to earnings may also be a confident powerful signal that in the future firm will prolong significant growth prospects. This may mean greater share price.<sup>21</sup>

**3.5.6 Discounted cash flow model**

A direct valuation technique refers to the discounted cash flow model. It evaluates the firm by offering its future cash flows, and then use the Net Present Value (NPV) method to measure these cash flows. The analysis that is done for the DCF, cash flows are developed using a number of theories about how the business will work in the future, and then it predicts how this firm productivity transfers into a cash flow generated by the business – in this case investors care the most about it.

Net Present Value is a mathematical method for transferring each of these specified annual cash flows to today's equivalent number, so that the projected cash flows for each year can be added together and compared in current amount of money.

In many cases can be used discounted cash flow model, as it seeks to directly and accurately assess the value created by the business. Thus, it is the most theoretically correct method of valuation: the value of a company eventually derives from the proper value of their future cash flows for their stakeholders.

Discounted cash flow model is perhaps the most widely used evaluation technique, because of its theoretical foundations and its capability to apply in almost every all cases. As well it is used by different internal corporate finance, investment bankers, business development specialists and so on.<sup>22</sup>

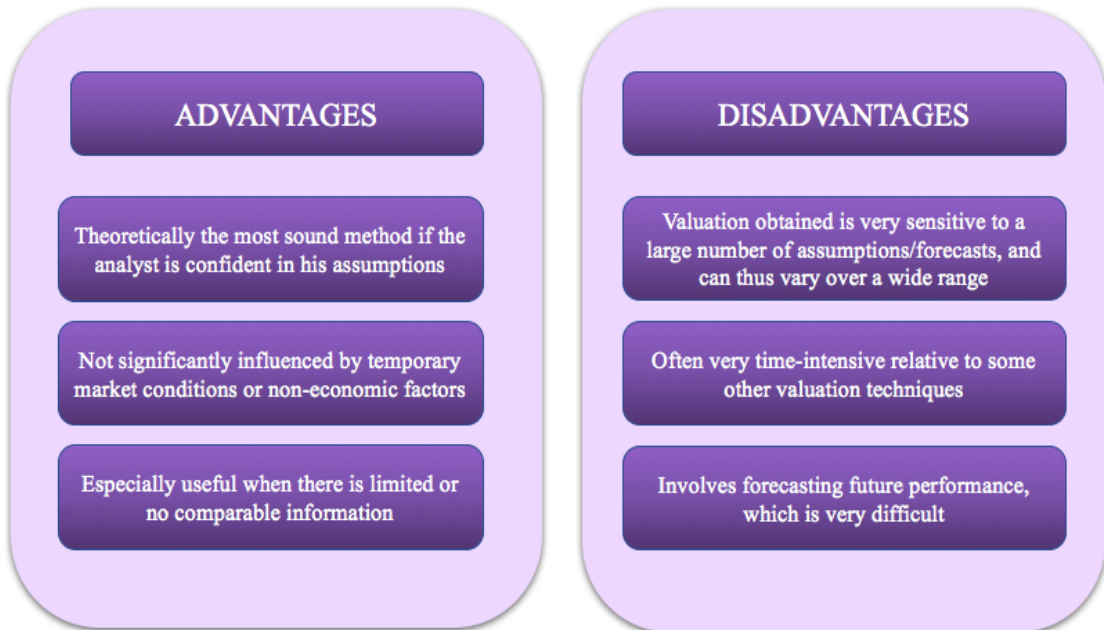
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<sup>21</sup> Zyla, M. (2012). Fair value measurements. Hoboken, N.J: Wiley., ISBN: 978-1-118-22907-1

<sup>22</sup> Streetofwalls.com. (2018). Discounted Cash Flow Analysis | Street Of Walls. [online] Available at:

<http://www.streetofwalls.com/finance-training-courses/investment-banking-technical-training/discounted-cash-flow-analysis/> [Accessed 17 Jan. 2018].

**Figure 5: Issues using the Discounted cash flow model**



Source: own processing, data from: STREETOFWALLS, 2017

**Step 1:**

The equation above is the main step, and the basic discounted cash flow (DCF) model. However, to use the model in this form, the analyst should make a forecast of all appropriate cash flows in the uncertain future. For clearness, cash flows or net cash flows of an enterprise or business as a whole.  $V_c$  is the value of the enterprise's equity or the present value of the expected cash flows to the owners of the enterprise's capital.

**Formula:**

$$V_c = \frac{FCF_1}{(1 + r_s)^1} + \frac{FCF_2}{(1 + r_s)^2} + \dots + \frac{FCF_{n \rightarrow \infty}}{(1 + r_s)^\infty}$$

$$\text{Value of } FCF_{2018 \rightarrow \infty} = \frac{FCF_{2017}}{r_s - g_{FCF}}$$

$V_c$ ...value of the entire company

$FCF_t$ ...free cash flow expected at the end of year t

$r_s$  ...required return

g...growth rate

**Step 2:**

In this step, there is need to calculate Value of common stock, which is equal to the value of entire company minus market value of all debt and minus market value of preferred stock.



**Formula:**

$$V_S = V_C - V_D - V_P$$

$V_S$  - Value of common stock

$V_C$  - Value of entire company, the market value of the entire enterprise (all assets)

$V_D$  - Market value of all debt

$V_P$  - Market value of preferred stock

**Step 3:**

In the next step, there should be found market value of preferred stock. The dividends of company of the next period should be divided by the required rate of return and afterwards there should be done sum of all the calculated dividends.

**Formula:**

$$V_P = \frac{D_1}{1 + r_s} + \frac{D_2}{(1 + r_s)^2} + \frac{D_3}{(1 + r_s)^3} + \dots + \frac{D_n}{(1 + r_s)^n}$$

$D_1$ ...the dividend next period

$r_s$ ...the required rate of return

**Step 4:**

And finally, market value of all debt can be found as short-term debt minus long-term debt.

**Formula:**

$$V_D = \text{short-term debt} + \text{long term debt}$$

$V_D$  - Market value of all debt

**3.5.7 Book value**

The price-to-book ratio is calculated by dividing the market price per share by the current book value of capital per share.

**Formula:**

$$\text{Price to book ratio} = \frac{\text{price per share}}{\text{book value of equity per share}}$$

Although the set is essentially consistent – both equity values are the numerator and denominator - there is a potential mismatch if there will not done careful calculation of book value of equity per share.

- If there are several classes of unallocated shares, the price per share may be another for other classes of stock, and it is unclear how the share capital should be divided between stocks.

- There is no need to include part of the equity, which relates to preferred shares, when calculating equity, because the price per share relates only to common equity.

Some problems can be mitigated by calculating the price to the book value using the total market value of equity and the book value of equity rather than the value of the stock.

**Formula:**

$$\text{Book value} = \frac{\text{total shareholder equity}}{\text{shares of common stock}}$$

The most secure way to measure this ratio when there are several classes of equity is to use the numerator of all ranks of ordinary shares in the complex market value and the components of the capital value in the denominator - still ignore the preferred shares for this calculation.

The standards of accounting can influence price to book and the book value of equity and deflect comparison made between companies.<sup>23</sup>

### 3.6 Investment

The term "investment" means a portfolio of assets acquired with available funds that provides income in the form of periodic cash flows and / or profit (or loss) in the number of the initial amount of investment (capital). As well it tells that there are two parts (one or both) for returning the investment:

- Change in the cost of initial capital (cost of capital), which may be negative or positive
- Periodic cash flow

Accordingly, the purpose of the investment is to increase the number of initial investment by:

- Receiving income from the value of assets (making a capital gain)
- Earning a periodic cash flow

Assets need to be managed. Funds/ portfolios management is a practice of asset allocation, that is, the current decision to allocate funds between risky and non-risk assets, as well in the asset classes should be selection of specific assets This is a balance between risk and income. There is depth study of the asset market, that is based on the asset allocation function.

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<sup>23</sup> Pages.stern.nyu.edu. (2018). Cite a Website - Cite This For Me. [online] Available at: <http://pages.stern.nyu.edu/~adamodar/pdfiles/valn2ed/ch19.pdf> [Accessed 12 Jan. 2018].

Investments are not gambling. Gambling is a chance at which the likelihood of a loss (= risk) is high. With regard to investments, the probability of a loss may be small, as there are methods of managing investments to reduce risk and increase profits.

Investment is not gambling. Gambling is a game of chance in which the probability of loss (= risk) is high. With investments, the probability of loss can be small because there are methods of investment management to reduce risk and enhance returns.

Investments are also not speculations. The speculation consists in investing own or borrowed funds in the short-term, and the probability of payments is significantly higher than that of gambling. This is because it is based on a research (technical and fundamental). Nonetheless, the risk is lower than in gambling, and higher than in long-term investments.<sup>24</sup>

### **3.7 Samsung Co., Ltd**

#### **Company overview**

Samsung Electronics Co., Ltd, through its subsidiaries, engages in the manufacture and sale of semiconductors, telecommunication products, home appliances, and digital media products segments. The company operates in four segments: Digital Media, Telecommunication Network, Semiconductor, and LCD. The company's digital media business produces a range of products, including digital televisions with monitors; audio-visual devices, such as blu-ray disc player; and all-in-one color printers. Its product lineup includes refrigerators, air conditioners, washers, ovens, vacuum cleaners and other appliances. Telecommunication Network business: The company offers a range of mobile phones, including 3G and multimedia phones, in addition to telecommunication systems. It also offers personal computers and MP3 players. Semiconductor business: This segment consists of three major divisions: Memory, Large Scale Integration (LSI), and Storage. In the memory category, the company engages in the development of new memory devices, multichip packages, fusion memory; and the commercialization of nanotechnology. It operates in the dynamic random-access memory (DRAM), static random access memory (SRAM), and flash markets. LSI division focuses on five main areas: display driver ICs (DDIs), smartcard chips for SIM cards, navigation application processors, CMOS image

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<sup>24</sup> Pages.stern.nyu.edu. (2017). Cite a Website - Cite This For Me. [online] Available at: <http://pages.stern.nyu.edu/~adamodar/pdfiles/valn2ed/ch13.pdf> [Accessed 31 Sep. 2017].

sensors, and systems-on-a-chip (SoCs) for media players. Storage division produces hard disk drives that provide high data storage capacity to both mobile devices and digital home appliances. LCD business The LCD business produces panels for TVs, digital information displays, notebook PCs and desktop monitors, as well as various display panels for mobile products, such as mobile phones, game consoles, PDAs and MP3 players.

### **History of company**

In year 1938 was founded Samsung Electronics Co., Ltd.. Lately in 1969 Samsung Electronics was established. Afterwards the company in year 1971 exports first black-and-white television to Panama. Later Samsung Group enters the semiconductor market by forming Telecommunications Co and Samsung Semiconductor in 1978. Then in 1983 the company enters the personal computer market. As well in 1984 the firm was formerly prominent as Samsung Electronics Manufacturing and changed its name to Samsung Electronics Co, Ltd.. Long time ago in 1988 Samsung Electronics and Samsung Semiconductor merge. Samsung started producing memory and hard drives for use in personal computers in the early and mid-1990s. Still it is a big part of Samsung's business today. After in 1995 Exports reach \$10 billion. Regarding to the Asian economic crisis in 1997 company battles it. And later in 1999 the firm undergoes a major restructuring, and profits reach \$2.4 billion. And in 2000 sales reach \$26 billion and net profits climb to \$4.7 billion. "The annual profit far exceeded all other years except for 2004," Cho of Samsung said. On June 26, 2009, Samsung Electronics Co. Ltd. has teamed up with Kraft Foods Inc. to build a new breed of 21st-century vending machines. For 2010. HP, Samsung's biggest global rival in sales, is projecting about \$120 billion in sales

## **4. PRACTICAL PART**

### **4.1 Fundamental analysis**

#### **4.1.1 Dividend Discount Model**

##### **4.1.1.1 Gordon Model: Constant-Growth Model**

###### **Step 1:**

For calculation of growth rate of dividends was taken period from 2000 till 2017. The is such a big difference in dividends if compare year 2000 and 2017. The dividends have increased by 55 times, from 500 KRW to 27,500 KRW. Based on this huge difference the growth rate equals to 72.3%, which is high rate. The best solution in this case, to be secure and not to use such high growth rate, there was done recalculation. The

new growth rate was calculated only from 2014 till 2017, because the last four years looks more stable than other years. Calculated new growth rate equals to 12.4 %, which is 5 times smaller than growth rate of 72.3%.

**Table 1: Percentage change of dividends – Samsung Co., Ltd (on September, 27)**

Year	Dividends per share in KRW	Change
2017	27,500	-3.6%
2016	28,500	36%
2015	21,000	5%
2014	20,000	526%
2013	3,800	-211%
2012	8,000	45%
2011	5,500	10%
2010	5,000	-60%
2009	8,000	0%
2008	8,000	0%
2007	8,000	45%
2006	5,500	0%
2005	5,500	-82%
2004	10,000	82% %
2003	5,500	0%
2002	5,500	37%
2001	4,000	800%
2000	500	-
Growth Rate	-	72.3%

Source: own calculations, data from: YahooFinance, Historical data, 2017

**Formula:**

$$\begin{aligned}
 \text{Growth Rate } (g)_{2000-2017} &= \\
 &= \frac{-3.6 + 36 + 5 + 526 - 211 + 45 + 10 - 60 + 45 - 82 + 82 + 37 + 800}{17} \\
 &= 72.3\%
 \end{aligned}$$

**Step 2:**

**Table 2: Percentage change of dividends – Samsung Co., Ltd (on September, 27)**

Year	Dividends per share in KRW	Change in dividends
2017	27,500	-3.60%
2016	28,500	36%
2015	21,000	5%
2014	20,000	-
Growth Rate	-	12.4%

Source: own calculations, data from: YahooFinance, Historical data, 2017

$$\text{Growth Rate } (g)_{2014-2017} = \frac{36 - 3.6 + 5}{3} = \frac{37.4}{3} = 12.4\%$$

**Step 3:**

Estimated dividend:

$$D_{2018} = D_{2017} * g = 27,500 * 1.124 = 30,910 \text{ KRW}$$

**Step 4:**

Required return can be found through Capital asset pricing model

**Formula:**

$$CAPM = R_f + B + R_m$$

$R_f$ ... risk free rate

$B$ ... beta of the security

$R_m$ ... expected market return

Asia Pacific 10-Year government bond Yields for South Korea = 2.55%

$$R_f = 2.55\%$$

$$B = 1.46$$

Expected market return can be found through the average annual return for Korea stock. It is equal to 10%, as well as for the S&P 500 since its inception back in 1928.

$$R_m = 10\%$$

$$CAPM = r_s = 2.55\% + 1.46 * (10\% - 2.55\%) = 13.4\%$$

**Step 5:**

$$P_0 = \frac{D_1}{k_t - g} = \frac{30,910}{13.4\% - 12.4\%} = \frac{30,910}{0.1} = 309,100 \text{ KRW}$$

$D_1$ ... most recent dividend

$k_t$ ... required return

$g$ ... constant rate of growth

**Interpretation:**

Current price of share 2,820,000 KRW and price calculated by the Constant-Growth Model is 309,100 KRW, so it means that this model is not appropriate to use for investigation of Samsung fair value due to extremely large difference in dividends, and this model is used for companies that have more stable dividends growth. Based on the result it is visible that there should be applied another model, such as Variable-Growth Model.

#### 4.1.1.2 Gordon Model: Variable-Growth Model

##### Step 1:

To find the value of the cash dividends at the end of each year,  $D_t$ , during the initial growth period, years 1 through N is used

##### Formula:

$$D_t = D_0 * (1 + g)^t$$

$D_0$ ...the most recent dividend

$g$ ...growth rate

For calculation of the dividend amount for each year, there is need to adjust the most recent dividend and the initial growth rate.

The most recent dividend for Samsung 27,500 KRW in year 2017. There is expectation that these dividends will increase at 12.4 % growth rate over the next three years. As calculated bellow:

**Table 3: Percentage change of dividends – Samsung Co., Ltd (on September, 27)**

Year	Dividends per share in KRW	Change in dividends
2017	27,500	-3.60%
2016	28,500	36%
2015	21,000	5%
2014	20,000	-
Growth Rate	-	12.4%

Source: own calculations, data from: YahooFinance, Historical data, 2017

$$\text{Growth Rate } (g)_{2014-2017} = \frac{36 - 3,6 + 5}{3} = \frac{37.4}{3} = 12.4\%$$

##### Step 2:

Required return can be found through Capital asset pricing model

##### Formula:

$$CAPM = R_f + B + R_m$$

$R_f$ ... risk free rate

$B$ ... beta of the security

$R_m$ ... expected market return

Asia Pacific 10-Year government bond Yields for South Korea = 2.55%

$R_f = 2.55\%$

$B = 1.46$

Expected market return can be found through the average annual return for Korea stock. It is equal to 10%, as well as for the S&P 500 since its inception back in 1928.

$$R_m = 10\%$$

$$CAPM = r_s = 2.55\% + 1.46 * (10\% - 2.55\%) = 13.4\%$$

**Step 3:**

To find the present value of the dividends expected during the initial growth period

**Formula:**

$$PV \text{ of price of dividends} = \sum_{t=1}^n \frac{D_0 * (1 + g)^t}{(1 + r_s)^t} = \sum_{t=1}^n \frac{D_t}{(1 + r_s)^t}$$

**Table 4: Present value of dividends – Samsung Co., Ltd (on September, 28)**

t	End of year	D0 = D2020 in KRW	(1+g) <sup>t</sup>	Dt in KRW	(1+r <sub>s</sub> ) <sup>t</sup>	Present value of dividends in KRW
1	2018	27,500	1.124	30,910	1.134	27,257.49559
2	2019	27,500	1.264	34,742.84	1.285	27,017.12967
3	2020	27,500	1.42	39,050.952	1.458	56,946.99227
Sum of present value of dividends in KRW						111,221.6175

Source: own calculations, data from: YahooFinance, Historical data, 2017

**Growth rate**

**Formula:**

$$(1 + g)^t$$

$$(1 + 0,124)^1 = 1.124$$

$$(1 + 0,124)^2 = 1.263376$$

$$(1 + 0,124)^3 = 1.420034624$$

**Future value of dividends**

**Formula:**

$$FV \text{ dividends} = \text{Recent dividend} * (1 + g)^t$$

$$FV \text{ dividends}_{2018} = 27,500 * 1.124 = 30,910 \text{ KRW}$$

$$FV \text{ dividends}_{2019} = 27,500 * 1.263376 = 34,742.84 \text{ KRW}$$

$$FV \text{ dividends}_{2020} = 27,500 * 1.420034624 = 39,050.95216 \text{ KRW}$$



## Required return

### Formula:

$$(1 + r_s)^t$$

$$(1 + 0.134)^1 = 1.134$$

$$(1 + 0.134)^2 = 1.285956$$

$$(1 + 0.134)^3 = 1.458274104$$

## Present value of dividends

### Formula:

$$PV = FV \text{ dividends} / (1 + r_s)^t$$

$$PV_{2018} = 30,910 / 1.134 = 27,257.49559 \text{ KRW}$$

$$PV_{2019} = 34,742.84 / 1.285956 = 27,017.12967 \text{ KRW}$$

$$PV_{2020} = 39,050.95216 / 1.458274104 = 56,946.99227 \text{ KRW}$$

## Sum of present value of dividends:

$$\text{Sum PV} = 27,257.49559 + 27,017.12967 + 56,946.99227 = 111,221.6175 \text{ KRW}$$

## Step 4:

In this step, the value of the stock at the end of the initial period is founded

### Formula:

$$P_n = \frac{D_n + 1}{r_s - g}$$

Which is the present value of all dividends expected from year N+1 to infinity

### Formula:

$$PV \text{ of price of stock} = \frac{1}{(1 + r_s)^n} * \frac{D_n + 1}{r_s - g}$$

$$n = 2020, D_{n+1} = D_{2020+1} = D_{2021}$$

By using D2021, required return is equal to 13.4% and dividend growth rate is equal to 12.4%

$$D_{2021} = D_{2020} * (1 + 0.124) = 39,050.952 * 1.124 = 43,893.27005 \text{ KRW}$$

There was done calculation of the value of the stock at the end of the period 2020 as follows:

$$P_{2020} = \frac{D_{2021}}{(r_s - g)} = \frac{43,893.27005}{(13.4\% - 12.4\%)} = 43,893.27005 / 0.01 = 4,389,327 \text{ KRW}$$

Afterwards the share value of 4,389,327 KRW at the end of year 2020 should be converted into a present. End of year 2018.

$$P_{2020}/(1 + r_s)^3 = 4,389,327 / (1 + 0.134)^3 = 3,009,946.476 \text{ KRW}$$

**Step 5:**

Adding the PV of the initial dividend stream, that was found in Step 2, to the PV of the stock at the end of the initial growth period, founded in Step 3.

**Formula:**

$$P_0 = \sum_{t=1}^n \frac{D_0 * (1 + g)^t}{(1 + r_s)^t} + \left( \frac{1}{(1 + r_s)^n} * \frac{D_{n+1}}{r_s - g} \right)$$

where:

$$\left. \sum_{t=1}^n \frac{D_0 * (1 + g)^t}{(1 + r_s)^t} \right\} \text{PV of price of dividends during the initial growth period}$$

$$\left( \frac{1}{(1 + r_s)^n} * \frac{D_{n+1}}{r_s - g} \right) \left. \right\} \text{PV of price of stock at the end of the growth period}$$

$$P_{2018} = 111,221.6175 + 3,009,946.476 = 3,121,168.1 \text{ KRW}$$

**Interpretation:**

The result shows that in year 2018 the predicted stock price of Samsung equal to 3,121,168.1 KRW, which is higher by the current stock price in year 2017. The current value equal to 2,820,000 KRW. Company is currently undervalued and so it is a good opportunity to invest in to the company.

**4.1.2 Price/Earnings Multiples**

**Step 1:**

In price to earnings multiples model involved determining a six-year price target based on a reasonable, historical valuation.

As the first step, there is need to find EPS for the last 6 years.

**Table 5: Net income, Outstanding shares, Share price – Samsung (on September, 27)**

Year	Net income in KRW	Total Shares Outstanding in KRW	Share Price in KRW
2012	23,185,375,000	150,620,000	1,522,000
2013	29,821,215,000	150,770,000	1,396,000
2014	23,082,499,000	150,078,000	1,352,000
2015	18,694,628,000	148,071,000	1,260,000
2016	22,415,655,000	142,070,000	1,802,000
2017	29,614,445,000	129,100,000	2,820,000

Source: own calculations, data from: Morningstar, Income statement, 2017

## Earnings per share

### Formula:

$$EPS = \frac{\text{Earnings}}{\text{Total Shares Outstanding}} = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Total Shares Outstanding}}$$

$$EPS_{2012} = \frac{23,185,375,000 - 0}{150,620,000} = 153,932.910 \text{ KRW}$$

$$EPS_{2013} = \frac{29,821,215,000 - 0}{150,770,000} = 197,792.763 \text{ KRW}$$

$$EPS_{2014} = \frac{23,082,499,000 - 0}{150,078,000} = 153,893.348 \text{ KRW}$$

$$EPS_{2015} = \frac{18,694,628,000 - 0}{148,071,000} = 126,254.486 \text{ KRW}$$

$$EPS_{2016} = \frac{22,415,655,000 - 0}{142,070,000} = 157,778.947 \text{ KRW}$$

$$EPS_{2017} = \frac{29,614,445,000 - 0}{129,100,000} = 229,391.5182 \text{ KRW}$$

### Interpretation:

The highest earnings per share for Samsung is 229,391.5182 KRW in year 2017. Means that in this year company had higher earnings in comparison to other five years and as well Samsung has strong financial position. It is a good time for investors to invest their money.

### Step 2:

As the second step, there is need to find P/E ratio for the last 5 years.

### Formula:

$$P/E = \frac{\text{Share Price}}{\text{Earning Per Share}}$$

$$P/E_{2012} = \frac{1,522,000}{153,932.910} = 9.89$$

$$P/E_{2013} = \frac{1,396,000}{197,792.763} = 7.05$$

$$P/E_{2014} = \frac{1,352,000}{153,893.348} = 8.78$$

$$P/E_{2015} = \frac{1,260,000}{126,254.486} = 9.75$$

$$P/E_{2016} = \frac{1,802,000}{157,778.947} = 11.42$$

$$P/E_{2017} = \frac{2,820,000}{229,391.5182} = 12.29$$

**Interpretation:**

The highest price to earnings ratio for Samsung was 12.29 in year 2017.

It means the earnings per share of the company is covered 12.29 times by the market price of its share. In other words, \$1 of earnings had a market value of \$12.29.

**Step 3:**

Afterwards there should be found average price to earnings for selected 5 years.

$$\begin{aligned} \text{Average } P/E_{2012-2017} &= \frac{9.89 + 7.05 + 8.78 + 9.75 + 11.42 + 12.29}{6} = \frac{61.18}{6} \\ &= 10.19 \end{aligned}$$

**Interpretation:**

Average price to earnings ratio for six years of selected company is high. Means that company Samsung has a strong position in the market.

**Step 4:**

To calculate growth rate there was found percentage change of dividends per share including time period from year 2014 till 2017.

**Table 6: Percentage change of dividends – Samsung Co., Ltd (on September, 27)**

Year	Dividends per share in KRW	Change in dividends
2017	27,500	-3.60%
2016	28,500	36%
2015	21,000	5%
2014	20,000	-
Growth Rate	-	12,4%

Source: own calculations, data from: YahooFinance, Historical data, 2017

$$\text{Growth Rate } (g)_{2014-2017} = \frac{36 - 3.6 + 5}{3} = \frac{37.4}{3} = 12.4\%$$

**Step 5:**

Expected Earnings per share for year 2018

**Table 7: Earnings per share – Samsung Co., Ltd (on October, 3)**

Year	EPS in KRW
2012	153,932.91
2013	197,792.763
2014	153,893.348
2015	126,254.486
2016	157,778.947
2017	229,391.5182
<b>Total</b>	<b>1,019,043.972</b>
<b>Average</b>	<b>169,840.662</b>

Source: own calculations, data from: Marketwatch, Income statement, 2017

**Formula:**

$$\text{Average EPS} = \frac{EPS_{2012} + EPS_{2013} + \dots + EPS_n}{n}$$

$$\text{Average EPS} = \frac{153,932.91 + 197,792.763 + 153,893.348 + 126,254.486 + 157,778.947 + 229,391.5182}{6}$$

$$= \frac{1,019,043.972}{6} = 169,840.662 \text{ KRW}$$

**Table 8: Expected earnings per share – Samsung Co., Ltd (on October, 3)**

t	Average EPS in KRW	$(1+g)^t$	Expected EPS in KRW
1	169,840.662	1.124	190,900.9041
2	169,840.662	1.263376	214,572.6162
3	169,840.662	1.420034624	241,179.6206
4	169,840.662	1.596118917	271,085.8936
5	169,840.662	1.794037663	304,700.5444
6	169,840.662	2.016498333	342,483.4119
7	169,840.662	2.266544127	384,951.3549
8	169,840.662	2.547595598	432,685.3229
<b>Average EPS 2017</b>			<b>297,819.9586</b>

Source: own calculations, data from: Marketwatch, Income statement, 2017

**In order to predict the EPS for year 2017**

**Formula:**

$$(1 + g)^t$$

$$(1 + 0.124)^1 = 1.124$$

$$(1 + 0.124)^2 = 1.263376$$

$$(1 + 0.124)^3 = 1.420034624$$

$$(1 + 0.124)^4 = 1.596118917$$

$$(1 + 0.124)^5 = 1.794037663$$

$$(1 + 0.124)^6 = 2.016498333$$

$$(1 + 0.124)^7 = 2.266544127$$

$$(1 + 0.124)^8 = 2.547595598$$

### Expected Earnings Per Share

#### Formula:

$$\text{Expected EPS} = \text{Average EPS} * (1 + g)^t$$

$$\text{Expected EPS}_1 = 169,840.662 * 1.124 = 190,900.9041 \text{ KRW}$$

$$\text{Expected EPS}_2 = 169,840.662 * 1.263376 = 214,572.6162 \text{ KRW}$$

$$\text{Expected EPS}_3 = 169,840.662 * 1.420034624 = 241,179.6206 \text{ KRW}$$

$$\text{Expected EPS}_4 = 169,840.662 * 1.596118917 = 271,085.8936 \text{ KRW}$$

$$\text{Expected EPS}_5 = 169,840.662 * 1.794037663 = 304,700.5444 \text{ KRW}$$

$$\text{Expected EPS}_6 = 169,840.662 * 2.016498333 = 342,483.4119 \text{ KRW}$$

$$\text{Expected EPS}_7 = 169,840.662 * 2.266544127 = 384,951.3549 \text{ KRW}$$

$$\text{Expected EPS}_8 = 169,840.662 * 2.547595598 = 432,685.3229 \text{ KRW}$$

#### Formula:

$$\text{Average Expected EPS} = \frac{\text{EPS}_1 + \text{EPS}_2 + \dots + \text{EPS}_n}{n}$$

$$\text{Average Expected EPS}_{2018} = \frac{190,900 + 214,572 + 241,179 + 271,085 + 304,700 + 342,483 + 384,951 + 432,685}{6}$$

$$= \frac{297,819.9586}{8} = 297,819.9586 \text{ KRW}$$

#### Step 6:

Afterwards it is possible to calculate 5-year price target for Samsung

$$FV = \text{EPS}_{2018} * (1 + \text{Growth Rate})^5 * \text{Average P/E}$$

$$= 297,819.9586 * (1 + 0.124)^6 * 10.19 = 6,159,558.3 \text{ KRW}$$

#### Step 7:

Required return can be found through Capital asset pricing model

#### Formula:

$$CAPM = R_f + B + R_m$$

R<sub>f</sub>... risk free rate

B... beta of the security

R<sub>m</sub>... expected market return

Asia Pacific 10-Year government bond Yields for South Korea = 2.55%

R<sub>f</sub> = 2.55%

B = 1.46

Expected market return can be found through the average annual return for Korea stock. It is equal to 10%, as well as for the S&P 500 since its inception back in 1928.

R<sub>m</sub> = 10%

$CAPM = r_s = 2.55\% + 1.46 * (10\% - 2.55\%) = 13.4\%$

**Step 8:**

$$PV = FV * \frac{1}{(1+r)^n} = 6,159,558.3 * \frac{1}{(1+13.4\%)^6} = 2,896,484.73 \text{ KRW}$$

**Interpretation:**

Share price in year 2017 was 2,820,000 KRW and the present value calculated by the model is 2,896,484.73 KRW, which means the company is currently undervalued and so it is a good opportunity to invest in to the company.

### 4.1.3 PEG Ratio

The PEG ratio method provides an estimate of Samsung value by dividing a price-earnings ratio (PE) by a forecasted 10-year growth rate (G) to generate a measure, PE/G, called a "PEG."

**Formula:**

$$PEG = \frac{\text{Price to earnings ratio}}{\text{Growth Rate}(EPS)}$$

**Step 1:**

In order to calculate PEG ratio, as a step before should be done calculation for Earnings per share for year 2017.

$$\begin{aligned} EPS &= \frac{\text{Earnings}}{\text{Total Shares Outstanding}} = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Total Shares Outstanding}} \\ &= \frac{29,614,445,000 - 0}{129,100,000} = 229,391.5182 \text{ KRW} \end{aligned}$$

**Interpretation:**

The higher the EPS figure, the better it is for Company. As in case of Samsung, higher EPS is the sign of higher earnings also strong financial position and a reliable company to invest money.

**Step 2:**

Based on the calculation of Earnings per share, afterwards was calculated Price to Earnings for year 2017.

$$P/E = \frac{\text{Share Price}}{\text{Earning Per Share}} = \frac{2,820,000}{229,391.5182} = 12.29$$

**Interpretation:**

The result means that P/E value of 12.29 in year 2017 indicates that investors are anticipating higher growth in the future.

**Step 3:**

For the calculation of growth rate was taken net income of selected company Samsung from year 2010 till 2017.

**Table 9: Net income growth rate– Samsung Co., Ltd (on October, 3)**

Year	Net income in KRW
2010	15,799,035,000
2011	13,382,645,000
2012	23,185,375,000
2013	29,821,215,000
2014	23,082,499,000
2015	18,694,628,000
2016	22,415,655,000
2017	29,614,445,000
Growth Rate	9%

Source: own calculations, data from: Morningstar, Income statement, 2017

**Formula:**

$$\text{Growth Rate}(g) = \left( \frac{\text{Net Income Present}}{\text{Net Income Past}} \right)^{\left( \frac{1}{N-1} \right)^{-1}}$$

$$\text{Growth Rate}(g)_{2010-2017} = \left( \frac{29,614,445,000}{15,799,035,000} \right)^{\left( \frac{1}{8-1} \right)^{-1}} = 9\%$$



#### Step 4:

**Table 10: P/E and PEG ratio – Samsung Co., Ltd (on October, 5)**

Year	P/E ratio	PEG ratio
2012	9.89	1.10
2013	7.05	0.78
2014	8.78	0.98
2015	9.75	1.08
2016	11.42	1.27
2017	12.29	1.37

Source: own calculations, data from: Gurufocus, 2017

1)  $PEG Ratio_{2012} = 9.89/9\% = 1.1$

PEG ratio can be compared as:

- **P/E > G and PEG > 1, then: Seek undervalued shares**
- P/E < G and PEG < 1, then: Avoid undervalued shares

From this, it can be stated that  $9.89 > 9\%$  and  $1.1 > 1$  and can be concluded:

Samsung has expectation of growth and the stock is currently overvalued due to heightened demand for share.

2)  $PEG Ratio_{2013} = 7.05/9\% = 0.78$

PEG ratio can be compared as:

- P/E > G and PEG > 1, then: Seek undervalued shares
- **P/E < G and PEG < 1, then: Avoid undervalued shares**

From this, it can be stated that  $7.05 < 9$  and  $0.78 < 1$  and can be concluded:

Samsung has underestimated growth and the stock is undervalued. Analysts' consensus estimates are currently set too low.

3)  $PEG Ratio_{2014} = 8.78/9\% = 0.98$

PEG ratio can be compared as:

- P/E > G and PEG > 1, then: Seek undervalued shares
- **P/E < G and PEG < 1, then: Avoid undervalued shares**

From this, it can be stated that  $8.78 < 9$  and  $0.98 < 1$  and can be concluded:

Samsung has underestimated growth and the stock is undervalued. Analysts' consensus estimates are currently set too low.

4)  $PEG Ratio_{2015} = 9.75/9\% = 1.08$

PEG ratio can be compared as:

- **P/E > G and PEG > 1, then: Seek undervalued shares**

- P/E < G and PEG < 1, then: Avoid undervalued shares

From this, it can be stated that  $09.75 > 9$  and  $1.08 > 1$  and can be concluded:

Samsung has expectation of growth and the stock is currently overvalued due to heightened demand for share.

$$5) PEG Ratio_{2016} = 11.42 / 9\% = 1.27$$

PEG ratio can be compared as:

- **P/E > G and PEG > 1, then: Seek undervalued shares**
- P/E < G and PEG < 1, then: Avoid undervalued shares

From this, it can be stated that  $11.42 > 9$  and  $1.27 > 1$  and can be concluded:

Samsung has expectation of growth and the stock is currently overvalued due to heightened demand for share.

$$6) PEG Ratio_{2017} = 12.29 / 9\% = 1.36$$

PEG ratio can be compared as:

- **P/E > G and PEG > 1, then: Seek undervalued shares**
- P/E < G and PEG < 1, then: Avoid undervalued shares

From this, it can be stated that  $12.29 > 9$  and  $1.36 > 1$  and can be concluded:

Samsung has expectation of growth and the stock is currently overvalued due to heightened demand for share.

### Step 5:

There is expectation that Net income of 2017 will be

**Table 11: Average net income – Samsung Co., Ltd (on October, 5)**

Year	Net income in KRW
2010	15,799,035,000
2011	13,382,645,000
2012	23,185,375,000
2013	29,821,215,000
2014	23,082,499,000
2015	18,694,628,000
2016	22,415,655,000
2017	29,614,445,000
<b>Average Net Income</b>	<b>21,999,437,125</b>

Source: own calculations, data from: Morningstar, Income statement, 2017

### Formula:

$$Average Net income = \frac{Net\ income_{2010} + Net\ income_{2011} + \dots + Net\ income_n}{n}$$

*Average Net income =*

$$= \frac{15,799,035,000 + 13,382,645,000 + 23,185,375,000 + 29,821,215,000 + 23,082,499,000 + 18,694,628,000 + 22,415,655,000 + 29,614,445,000}{8}$$

= 21,999,437,125 KRW

**Table 12: Expected net income – Samsung Co., Ltd (on October, 9)**

t	Average Net Income	(1+g) <sub>t</sub>	Expected Net income in KRW
1	21,999,437,125	1.124	24,727,367,329
2	21,999,437,125	1.263376	27,793,560,877
3	21,999,437,125	1.420034624	31,239,962,426
4	21,999,437,125	1.596118917	35,113,717,767
5	21,999,437,125	1.794037663	39,467,818,770
Average Expected Net Income 2018			31,668,485,434

Source: own calculations, data from: Morningstar, Income statement, 2017

### **Growth rate**

**Formula:**

$$(1 + g)^t$$

$$(1 + 0.124)^1 = 1.124$$

$$(1 + 0.124)^2 = 1.263376$$

$$(1 + 0.124)^3 = 1.420034624$$

$$(1 + 0.124)^4 = 1.596118917$$

$$(1 + 0.124)^5 = 1.794037663$$

### **Expected net income**

**Formula:**

$$\text{Expected net income} = \text{Average net income} * (1 + g)^t$$

$$\text{Expected net income}_1 = 21,999,437,125 * 1.124 = 24,727,367,329 \text{ KRW}$$

$$\text{Expected net income}_2 = 21,999,437,125 * 1.263376 = 27,793,560,877 \text{ KRW}$$

$$\text{Expected net income}_3 = 21,999,437,125 * 1.420034624 = 31,239,962,426 \text{ KRW}$$

$$\text{Expected net income}_4 = 21,999,437,125 * 1.596118917 = 35,113,717,767 \text{ KRW}$$

$$\text{Expected net income}_5 = 21,999,437,125 * 1.794037663 = 39,467,818,770 \text{ KRW}$$

### **Average expected net income 2018**

**Formula:**

$$\text{Average Expected net income}$$

$$= \frac{\text{Expected net income}_1 + \text{Expected net income}_2 + \dots + \text{Expected net income}_n}{n}$$

*Average Expected net income*

$$24,727,367,329 + 27,793,560,877 + 31,239,962,426 + 35,113,717,767 + 39,467,818,770$$

$$= \frac{\quad}{5}$$

$$= 31,668,485,434 \text{ KRW}$$

**Step 13:**

**Table 13: Net income expected growth rate – Samsung Co., Ltd (on October, 3)**

Year	Net income in KRW
2010	15,799,035,000
2011	13,382,645,000
2012	23,185,375,000
2013	29,821,215,000
2014	23,082,499,000
2015	18,694,628,000
2016	22,415,655,000
2017	29,614,445,000
2018	31,668,485,434
<b>Growth Rate</b>	<b>9%</b>

Source: own calculations, data from: Morningstar, Income statement, 2017

Expected Growth Rate is 9% in year 2018

$$\text{Growth Rate } (g)_{2010-2018} = \left( \frac{31,668,485,434}{15,799,035,000} \right)^{\left(\frac{1}{9-1}\right)^{-1}} = 9 \%$$

**Step 7:**

Expected Share price in 2018

**Table 14: Expected share price – Samsung Co., Ltd (on October, 15)**

t	Average share price in KRW	$(1+g)^t$	Expected Share Price in KRW
1	1,692,000	1.124	1,901,808
2	1,692,000	1.263376	2,137,632.192
3	1,692,000	1.420034624	2,402,698.584
4	1,692,000	1.596118917	2,700,633.208
5	1,692,000	1.794037663	3,035,511.726
6	1,692,000	2.016498333	3,411,915.18
7	1,692,000	2.266544127	3,834,992.662
8	1,692,000	2.547595598	4,310,531.753
<b>Expected share price 2018 in KRW</b>			<b>2,966,965.413</b>

Source: own calculations, data from: Morningstar, Income statement, 2017

**Growth rate**

**Formula:**

$$(1 + g)^t$$

$$(1 + 0.124)^1 = 1.124$$

$$(1 + 0.124)^2 = 1.263376$$

$$(1 + 0.124)^3 = 1.420034624$$

$$(1 + 0.124)^4 = 1.596118917$$

$$(1 + 0.124)^5 = 1.794037663$$

$$(1 + 0.124)^6 = 2.016498333$$

$$(1 + 0.124)^7 = 2.266544127$$

$$(1 + 0.124)^8 = 2.547595598$$

**Expected share price**

**Formula:**

$$\text{Expected share price} = \text{Average share price} * (1 + g)^t$$

$$\text{Expected share price}_1 = 1,692,000 * 1.124 = 1,901,808 \text{ KRW}$$

$$\text{Expected share price}_2 = 1,692,000 * 1.263376 = 2,137,632.192 \text{ KRW}$$

$$\text{Expected share price}_3 = 1,692,000 * 1.420034624 = 2,402,698.584 \text{ KRW}$$

$$\text{Expected share price}_4 = 1,692,000 * 1.596118917 = 2,700,633.208 \text{ KRW}$$

$$\text{Expected share price}_5 = 1,692,000 * 1.794037663 = 3,035,511.726 \text{ KRW}$$

$$\text{Expected share price}_6 = 1,692,000 * 2.016498333 = 3,411,915.18 \text{ KRW}$$

$$\text{Expected share price}_7 = 1,692,000 * 2.266544127 = 3,834,992.662 \text{ KRW}$$

$$\text{Expected share price}_8 = 1,692,000 * 2.547595598 = 4,310,531.753 \text{ KRW}$$

**Average expected share price 2018**

**Formula**

$$\text{Average Expected share price} =$$

$$= \frac{\text{Expected share price}_1 + \text{Expected share price}_2 + \dots + \text{Expected share price}_n}{n}$$

$$\text{Average Expected share price}_{2018}$$

$$= \frac{1,901,808 + 2,137,632 + 2,402,698 + 2,700,633 + 3,035,511 + 3,411,915 + 3,834,992 + 4,310,531}{8}$$

$$= \frac{23,735,723.3}{8} = 2,966,965.413 \text{ KRW}$$

**Step 8:**

Expected Earnings per share were calculated in previous chapter: Price/Earnings Multiples

Expected EPS = 297,819.9586 KRW

Expected Share Price 2018

Expected P/E Ratio in 2018 is

$$P/E_{2018} = \frac{\text{Expected Share Price}_{2018}}{\text{Expected Earnings Per Share}_{2018}} = \frac{296,6965.413}{297,819.9586} = 9.96$$

$$PEG \text{ Ratio}_{2018} = 9.96 / 9\% = 1.1$$

PEG ratio can be compared as:

- **P/E > G and PEG > 1, then: Seek undervalued shares**
- P/E < G and PEG < 1, then: Avoid undervalued shares

From this, it can be stayed that  $9.96 > 9\%$  and  $1.1 > 1$  and can be concluded:

There is expectation that in year 2018, Samsung is going to growth and the stock is currently overvalued due to heightened demand for share in year.

#### 4.1.4 Discounted Cash Flow Model

##### Step 1:

In the free cash flow valuation model, instead of valuing the firm's expected dividends, there will be done valuation of the firm's expected free cash flows.

**Formula:**

$$V_c = \frac{FCF_1}{(1+r_s)^1} + \frac{FCF_2}{(1+r_s)^2} + \dots + \frac{FCF_{n \rightarrow \infty}}{(1+r_s)^\infty}$$

$$\text{Value of } FCF_{2018 \rightarrow \infty} = \frac{FCF_{2017}}{r_s - g_{FCF}}$$

$V_c$ ...value of the entire company

$FCF_t$ ...free cash flow expected at the end of year t

$r_s$  ...required return

$g$ ...growth rate

Free Cash Flow<sub>2017</sub> = 10,961,572 KRW

$$\text{Growth Rate } (g)_{2012-2017} = \frac{-202 + 175 - 107 - 166 + 158}{5} = 28.4\%$$

**Table 15: Free cash flow – Samsung Co., Ltd (on October, 20)**

Year	Free Cash Flow in KRW	Change in Free Cash Flow
2017	10,961,572,000	202 %
2016	22,195,003,000	175 %
2015	12,679,658,000	107 %
2014	13,608,139,000	166 %
2013	22,615,110,000	158 %
2012	14,356,654,000	-
Growth Rate	-	28.4%

Source: own calculations, data from: Morningstar, Cash flow, 2017

For calculation of growth rate of free cash flow was taken period from 2012 till 2016. The free cash flow of year 2017 is much lower than in comparison to year 2016 and it will give higher growth rate. In 2017, it equals to 10,961,572 KRW and in 2016 equals to 22,195,003 KRW. In order to be secure there wasn't taken in to account year 2017 for the calculation of growth rate that will be used in estimation of this mode.

**Table 16: Percentage change free cash flow – Samsung Co., Ltd (on October, 20)**

Year	Free Cash Flow in KRW	Change in Free Cash Flow
2016	22,195,003,000	175%
2015	12,679,658,000	93%
2014	13,608,139,000	60%
2013	22,615,110,000	-
Growth Rate	-	7%

Source: own calculations, data from: Morningstar, Cash flow, 2017

$$\text{Growth Rate } (g)_{2012-2016} = \frac{175 - 93 - 60}{3} = 7\%$$

**Step 2:**

Required return can be found through Capital asset pricing model

**Formula:**

$$CAPM = R_f + B + R_m$$

R<sub>f</sub>... risk free rate

B... beta of the security

R<sub>m</sub>... expected market return

Asia Pacific 10-Year government bond Yields for South Korea = 2.55%

$$R_f = 2.55\%$$

$$B = 1.46$$

Expected market return can be found through the average annual return for Korea stock. It is equal to 10%, as well as for the S&P 500 since its inception back in 1928.

$$R_m = 10\%$$

$$CAPM = r_s = 2.55\% + 1.46 * (10\% - 2.55\%) = 13.4\%$$

**Step 3:**

**Table 17: Expected free cash flow – Samsung Co., Ltd (on October, 20)**

t	End of year	FCF in KRW	$(1+g_1)^t$	Expected FCF in KRW
1	2017	10,961,572,000	1.07	11,728,882,040
2	2018	10,961,572,000	1.1449	12,549,903,783
3	2019	10,961,572,000	1.225043	13,428,397,048
4	2020	10,961,572,000	1.31079601	14,368,384,841
5	2021	10,961,572,000	1.402551731	15,374,171,780

Source: own calculations, data from: Morningstar, Cash flow, 2017

**Growth rate**

**Formula:**

$$(1 + g)^t$$

$$(1 + 0.07)^1 = 1.07$$

$$(1 + 0.07)^2 = 1.1449$$

$$(1 + 0.07)^3 = 1.225043$$

$$(1 + 0.07)^4 = 1.31079601$$

$$(1 + 0.07)^5 = 1.402551731$$

**Expected FCF**

**Formula:**

$$Expected\ FCF * (1 + g)^t$$

$$Expected\ FCF_1 = 10,961,572,000 * 1.07 = 11,728,882,040\ KRW$$

$$Expected\ FCF_2 = 10,961,572,000 * 1.1449 = 12,549,903,783\ KRW$$

$$Expected\ FCF_3 = 10,961,572,000 * 1.225043 = 13,428,397,048\ KRW$$

$$Expected\ FCF_4 = 10,961,572,000 * 1.31079601 = 14,368,384,841\ KRW$$

$$Expected\ FCF_5 = 10,961,572,000 * 1.402551731 = 15,374,171,780\ KRW$$

**Step 4:**

$$\begin{aligned} Value\ of\ FCF_{2017 \rightarrow \infty} &= \frac{15,374,171,780 * (1 + 0.07)}{13.4\% - 7\%} = \frac{16,450,363,805}{0.064} \\ &= 257,036,934,453.125\ KRW \end{aligned}$$

**Step 5:**



$$\begin{aligned} \text{Total } FCF_{2018} &= 10,961,572,000 + 257,036,934,453.125 = \\ &= 267,998,506,453.125 \text{ KRW} \end{aligned}$$

**Step 6:**

**Table 18: Value of entire company – Samsung Co., Ltd (on October, 25)**

t	End of year	FCF in KRW	$(1+r_s)^t$	Present value of FCF in KRW
1	2017	10,961,572,000	1.134	9,666,289,242
2	2018	10,961,572,000	1.285956	8,524,064,587
3	2019	10,961,572,000	1.458274104	7,516,811,805
4	2020	10,961,572,000	1.653682834	6,628,581,839
5	2021	267,998,506,453.125	1.875276334	502,571,256,698.89
<b>Vc=Value of entire company in KRW</b>				<b>534,907,004,170.89</b>

Source: own calculations, data from: Morningstar, Cash flow, 2017

**Required return**

**Formula:**

$$(1 + r_s)^t$$

$$(1 + 0.134)^1 = 1.134$$

$$(1 + 0.134)^2 = 1.285956$$

$$(1 + 0.134)^3 = 1.458274104$$

$$(1 + 0.134)^4 = 1.653682834$$

$$(1 + 0.134)^5 = 1.875276334$$

**Present value of FCF**

**Formula:**

$$\text{Present Value of FCF} = \text{Free Cash Flow} / (1 + r_s)^t$$

$$PV \text{ of } FCF_{2017} = 10,961,572,000 / 1.134 = 9,666,289,242 \text{ KRW}$$

$$PV \text{ of } FCF_{2018} = 10,961,572,000 / 1.285956 = 8,524,064,587 \text{ KRW}$$

$$PV \text{ of } FCF_{2019} = 10,961,572,000 / 1.458274104 = 7,516,811,805 \text{ KRW}$$

$$PV \text{ of } FCF_{2020} = 10,961,572,000 / 1.653682834 = 6,628,581,839 \text{ KRW}$$

$$PV \text{ of } FCF_{2021} = 267,998,506,453.125 / 1.875276334 = 502,571,256,698.89 \text{ KRW}$$

**Value of entire company**

**Formula:**

$$V_c = PV \text{ of } FCF_{2017} + PV \text{ of } FCF_{2018} + \dots + PV \text{ of } FCF_n$$

$$V_c = 9,666,289,242 + 8,524,064,587 + 7,516,811,805 + 6,628,581,839$$

$$+ 502,571,256,698.89 = 534,907,004,170.89 \text{ KRW}$$

**Step 6:**

Value of common stock

**Formula:**

$$V_S = V_C - V_D - V_P$$

$V_S$  - Value of common stock

$V_C$  - Value of entire company, the market value of the entire enterprise (all assets)

$V_D$  - Market value of all debt

$V_P$  - Market value of preferred stock

**Step 7:**

Market value of all debt

**Formula:**

$$V_D = \text{short-term debt} + \text{long term debt}$$

In order to calculate market value of all debt, there was taken data for short-term debt and long-term debt for year 2016, as for 2017 it is not available at the moment.

Short-term debt<sub>2016</sub> = 12,746,789 KRW

Long-term debt<sub>2016</sub> = 1,302,780 KRW

$V_D = 12,746,789 + 1,302,780 = 14,049,569 \text{ KRW}$

Samsung has a total market value of debt 14 049 569 KRW, means that it is being traded in the bond market

**Step 8:**

Market value of preferred stock

**Formula:**

$$V_P = \frac{D_1}{1 + r_s} + \frac{D_2}{(1 + r_s)^2} + \frac{D_3}{(1 + r_s)^3} + \dots + \frac{D_n}{(1 + r_s)^n}$$

$D_1$ ...the dividend next period

$r$ ...the required rate of return

Based on the information from financial statements of company Samsung, there are no preferred stock.

**Step 9:**

$V_S = 534,907,004,170.89 - 14,049,569 - 0 = 534,892,954,601.89 \text{ KRW}$

The value of Samsung's common stock is therefore estimated to be 534,892,954,601.89 KRW

Total outstanding shares in year 2017 is 129,100,000 KRW

$Share\ price = V_S / Total\ outstanding\ shares$

$534,892,954,601.89 / 129,100,000 = 4,143.25\$$

$4,143.25 * 1,083.98 = 4,491,829.67\ KRW$

**Interpretation:**

Current share price is 2,820,000 KRW and share price calculated by the model is 4,491,829.67 KRW, means that company is undervalued. It shows that it is good opportunity to invest into a company.

**4.1.5 Book value per share**

**Step 1:**

**Formula:**

$$Book\ value = \frac{total\ shareholder\ equity}{shares\ of\ common\ stock}$$

**Table 19: Book value – Samsung Co., Ltd (on October, 29)**

Year	Total shareholder equity in KRW	Shares of common stock in KRW	Book value in KRW
2012	108,902,160,000,000	150,620,000	723,025.893
2013	136,830,100,000,000	150,770,000	907,541.9513
2014	147,087,280,000,000	150,078,000	980,072.2291
2015	147,764,690,000,000	148,071,000	997,931.3302
2016	157,576,750,000,000	142,070,000	1,109,148.59
2017	171,247,000,000,000	129,100,000	1,326,467.854

Source: own calculations, data from: Gurufocus, Total Equity, 2017

**Step 2:**

$$Book\ value\ per\ share_{2012} = \frac{108,902,160,000,000}{150,620,000} = 723,025.893\ KRW$$

$$Book\ value\ per\ share_{2013} = \frac{136,830,100,000,000}{150,770,000} = 907,541.9513\ KRW$$

$$Book\ value\ per\ share_{2014} = \frac{147,087,280,000,000}{150,078,000} = 980,072.2291\ KRW$$

$$Book\ value\ per\ share_{2015} = \frac{147,764,690,000,000}{148,071,000} = 997,931.3302\ KRW$$

$$Book\ value\ per\ share_{2016} = \frac{157,576,750,000,000}{142,070,000} = 1,109,148.59\ KRW$$

$$Book\ value\ per\ share_{2017} = \frac{171,247,000,000,000}{129,100,000} = 1,326,467.85\ KRW$$

**Interpretation:**

The highest book value per share, the better it is for the shareholder. By the calculations it is visible that the highest book value per share is in current year 2017. If the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid.

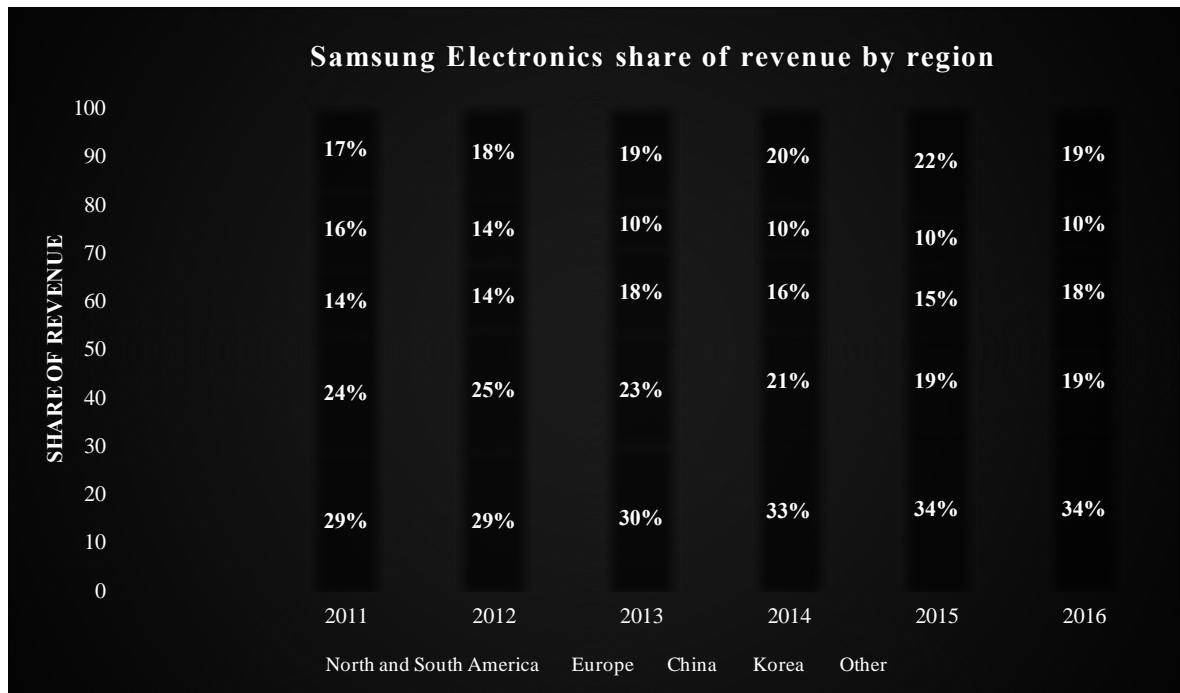
In other words, in 2017 the amount of money that a holder of a common share would get is 1,326,467.85 KRW if a company were to liquidate.

**4.2 Technical analysis**

**4.2.1 Performance by Region**

The graph bellow is showing percentage change of revenue for company Samsung over last six years.

**Figure 6: Performance by region – Samsung Co., Ltd (on September, 15)**



Source: own processing, data from: Statista, 2017

This statistic shows the share of revenue made for Samsung Electronics from 2011 to 2016, broken down by region.

**Table 20: Performance by region – Samsung Co., Ltd (on September, 15)**

Samsung Electronics share of revenue by region from 2011 to 2016 in KRW						
Country/ Year	2011	2012	2013	2014	2015	2016
America	47,500,000	58,200,000	69,400,000	68,047,975	68,222,183	68,634,693
Europe	39,100,000	49,500,000	52,700,000	43,303,257	38,124,161	38,354,681
China	23,100,000	28,200,000	40,100,000	32,992,957	30,098,022	36,336,014
Korea	26,500,000	29,200,000	22,800,000	20,620,598	20,065,348	20,186,674
Other	28,800,000	36,100,000	43,700,000	41,241,197	44,143,766	38,354,681
Revenue	165,000,000	201,103,613	228,692,667	206,205,987	200,653,482	201,866,745

Source: own processing, data from: Statista, 2017

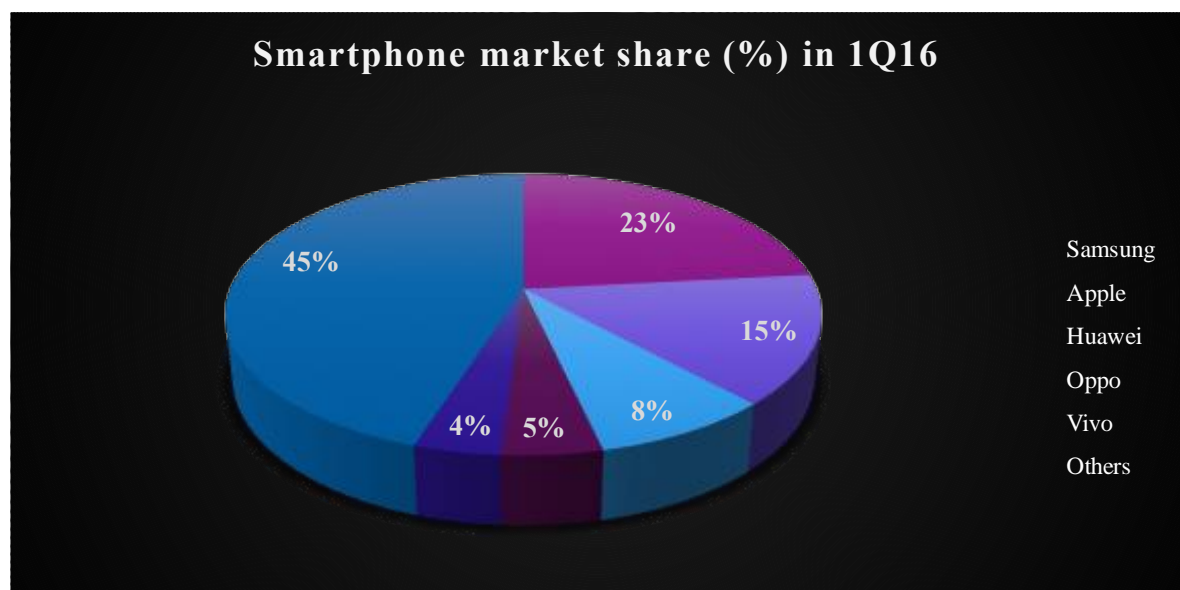
In 2011 the total revenue of company was equal to 165,000,000 KRW. The biggest percentage is taken by North and South America, which is 29% and equal to 47,500,000 KRW. China in this year had the smallest percentage, only 14% and equal to 23,100,000 KRW. In year 2012 situation didn't change a lot. Europe took 25 %, which is 49,500,00 KRW, before it was 24% and was equal to 39,100,000 KRW. As well Korea had 16% of total share of revenue, which is 26,500,00 KRW and it has decrease by 1% and became 29,200,000, which means it increase as the total revenue in 2012 was 201,103,613 KRW and was the highest over the six selected years. Afterward it has been change slightly in year 2013, when the total revenue was 228,692,667 KRW. In this year the highest percentage was taken by America. It was 30% and was equal to 69,400,000 KRW. Second place was by 23%, it was Europe 52,700,000 KRW. Next one is China, within 18%, had 40,100,000 KRW of revenue. Korea has decreased from previous years from 14% to 10%, and the revenue was 22,800,000 KRW in year 2013. In 2014 the situation was next: total revenue decreased by 22,486,680 KRW and became 206,205,987 KRW. The highest percentage was as before was taken by America – 33% in this time it was 68,047,975 KRW. And the lowest one was taken by Korea, which was only 10% and equal to 20,620,598 KRW. In year 2015 and 2016 Korea had only 10% as well, and was near 20,065,348 KRW and 20,186,674 KRW. America had 34% in both years 2015 and 2016. It was equal to 44,143,766 KRW and then decreased to 38,354,681 KRW. The total revenue in year 2015 increased by 5,552,505 KRW and became 200,653,482 KRW. In 2016 it decreased by 1,213,263 KRW and became 201,866,745 KRW. In Europe share of revenue of company Samsung has decreased by 2% from 2014 to 2015 and was equal to 38,124,161 KRW. So percentage of share revenue of Samsung in Europe and was 38,354,681 KRW in year 2016. For China there was change as well. From 2014 till 2015 the share of revenue decreased from 32,992,957 KRW to 30,098,022 KRW and afterwards

it has increase in 2016 by 6,237,991,8 KRW. In other countries, such as Asia, Africa, etc. during six years there was growth by 9,554,681.55 KRW of share of revenue for Samsung from 28,800,000 KRW to 38,354,681.55 KRW. It can be concluded from the historical statistics that over last 6 years the highest share of revenue is taken by America in total is 380,004,852.9 KRW, and the lowest one is taken by Korea, which is 139,372,621.4 KRW.

#### 4.2.2 Competitors

The graphs bellow created in order to show the percentage of companies that are taking place in the top of smartphone market in the last two years. As well as to determine the main competitors of company Samsung. Global sales of smartphones in total is 379,977.3 units in the first quarter of 2017. There was an increase of 9.1% over the first quarter of 2016 as it was 348,224.2 units. This is connected with that people are spending more money nowadays in order to get a better or even the best phone, which is the result in the rising of average selling prices of types of phones.

**Figure 7: Smartphone market share in 2016 (on September, 20)**



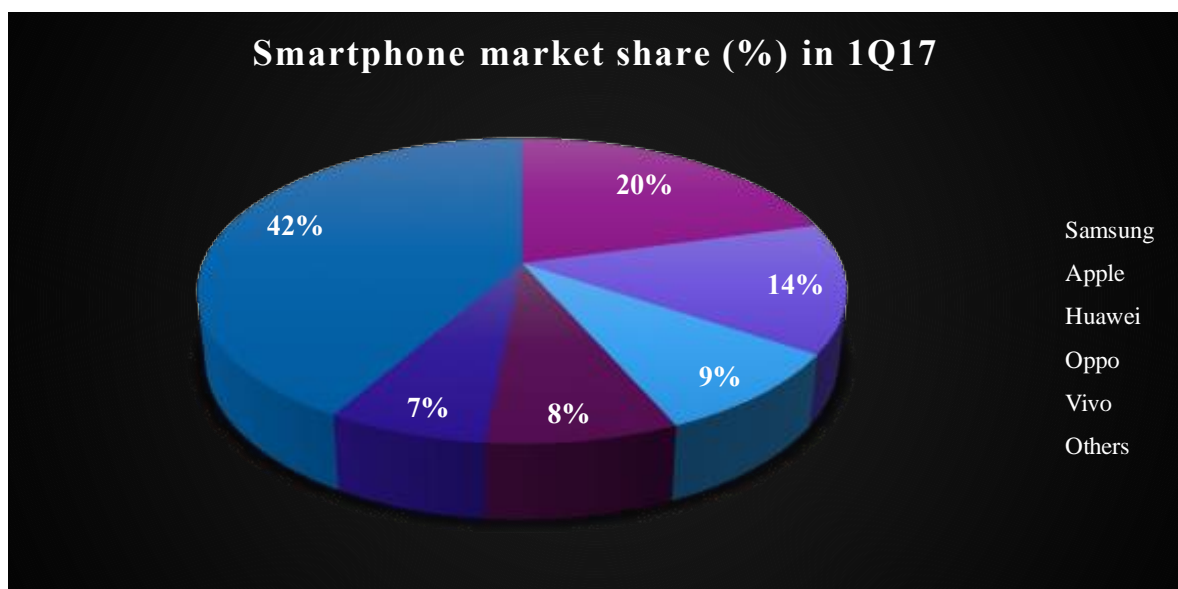
Source: own processing, data from: Gartner, 2017

In 2016, by smartphone market share the higher percentage is taken by Samsung and it is 23%. The total number of phones that was sold is 81,186.9 units. The second place in worldwide smartphone sales is taken by Apple, within 15%. Apple sold 51,629.5 units in year 2016, which is making Apple company the biggest competitor of Samsung on smartphone market. Third one is Huawei, within 8% in the market share. Company sold 28,861 which is twice less than Samsung has sold. Oppo has 5% of the market share and

sold 15,891.5 phones. Next one is Vivo within only 4%, which has the lowest percentage among all five companies mentioned before. It sold only 14,001 units. Other smaller companies that have sold phones, taking the percentage of 45% and there were sold 156,654.2 of phones, which is almost twice more than sold company Samsung over the year 2016.

In 2017 situation slightly has been changed in the smartphone market. Total units of smartphones that were sold decreased. The first place on the worldwide smartphone sales is still taken by Samsung, it has 20% of market share. In 2017 Samsung has decrease their market share by 2,515.5 units, and sold in this year 78671,4. Vice versa with company Apple, as its market share increased by 363 units, and in year 2017 company sold almost same amount 51992,5 units. On the third place is Huawei, as year before and its market share is 9% and company sold 34,181.2 units. Next one is Oppo, within market share of 8% and sold 30,922.3 smartphones. Vivo has sold 25,842.2 units and has market share of 7%, which is the smallest in comparison to other mentioned companies. Other smaller companies that have sold phones, taking the percentage of 42% and there were sold 156,654.2 of phones, that means that smaller companies increase their market share by 1,713.5 units.

**Figure 8: Smartphone market share in 2017 (on September, 20)**



Source: own processing, data from: Gartner, 2017

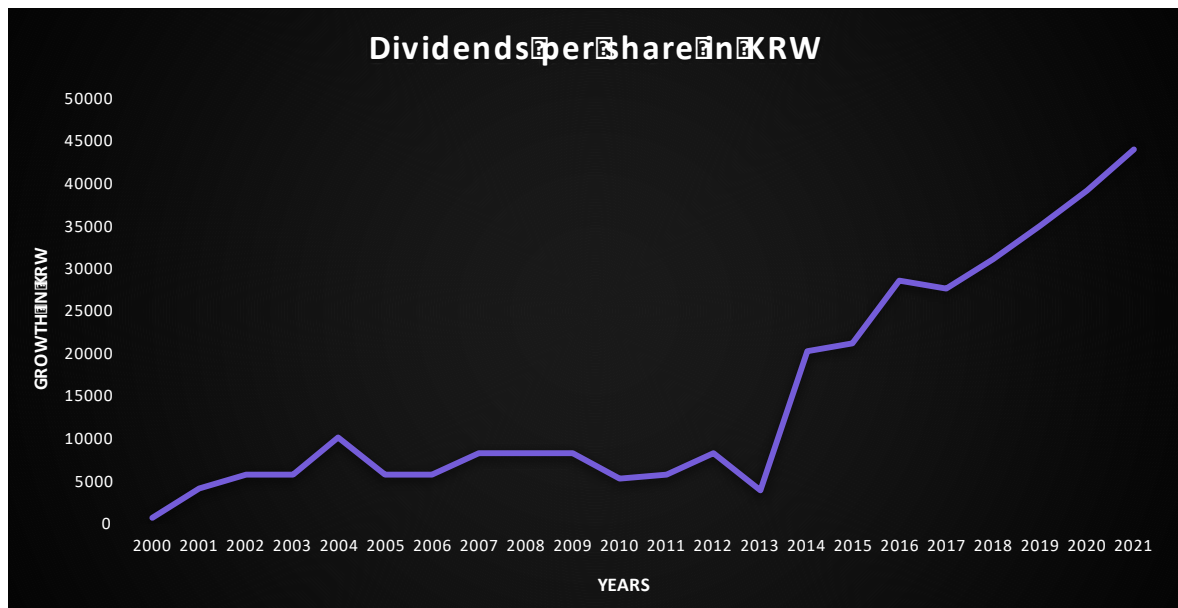
Samsung's smartphone sales declined 3.1 percent in the first quarter of 2017. "Although Samsung announced that preorders for the Galaxy S8 and S8 Plus are up 30

percent year over year, the absence of an alternative to Note 7 and the fierce competition in the basic smartphone segment are leading Samsung to continuously lose market share," said Mr. Gupta. "Sales of iPhones were flat, which led to a drop-in market share year over year. Similar to Samsung, Apple is increasingly facing fierce competition from Chinese brands Oppo and Vivo, among others, and its performance in China is under attack."<sup>25</sup>

### 4.2.3 Dividends per share

This graph is based on the calculations that were done for the prediction of future dividends for the company Samsung. The expected increase of dividends was calculated through the growth rate of 12.4%, which was previously determined. The prediction is that dividends will be growing in next 4 years. Till end of 2021 there is expectation that dividends will increased by approximately 5 times. The expected dividends in year 2018 will be 30,882.5 KRW, then in year 2019 will be 34,742.84 KRW, etc.

**Figure 9: Dividends per share – Samsung (on September, 27)**



Source: own processing, data from: YahooFinance, Historical data, 2017

The table is created in order to show the historical change of dividends over the last 18 years. It is visible that from year 2000 till 2017, there was huge increase of dividends from 500 KRW till 27,500 KRW. The dividends from that time till now have increased by 55 times. This means that company expanding on the market, as well it shows that

<sup>25</sup> Gartner.com. (2017). Gartner Says Worldwide Sales of Smartphones Grew 9 Percent in First Quarter of 2017. [online] Available at: <https://www.gartner.com/newsroom/id/3725117> [Accessed 31 Sep. 2017].



company has not constant or not stable growth of dividends. Table is showing that there was change, not only as increase of dividends, but as well as decrease during the years. From year 2000 till 2001 there was increase by 3,500 KRW, during 2002, 2003 dividends were stable and didn't change at all and were equal to 5,500 KRW. The same situation was for 2007, 2008, 2009, as the price was 8,000 KRW and didn't change for three years. There was huge increase by 7.2 times from 2013 till 2017. Current price of dividends per share is 27,500 KRW.

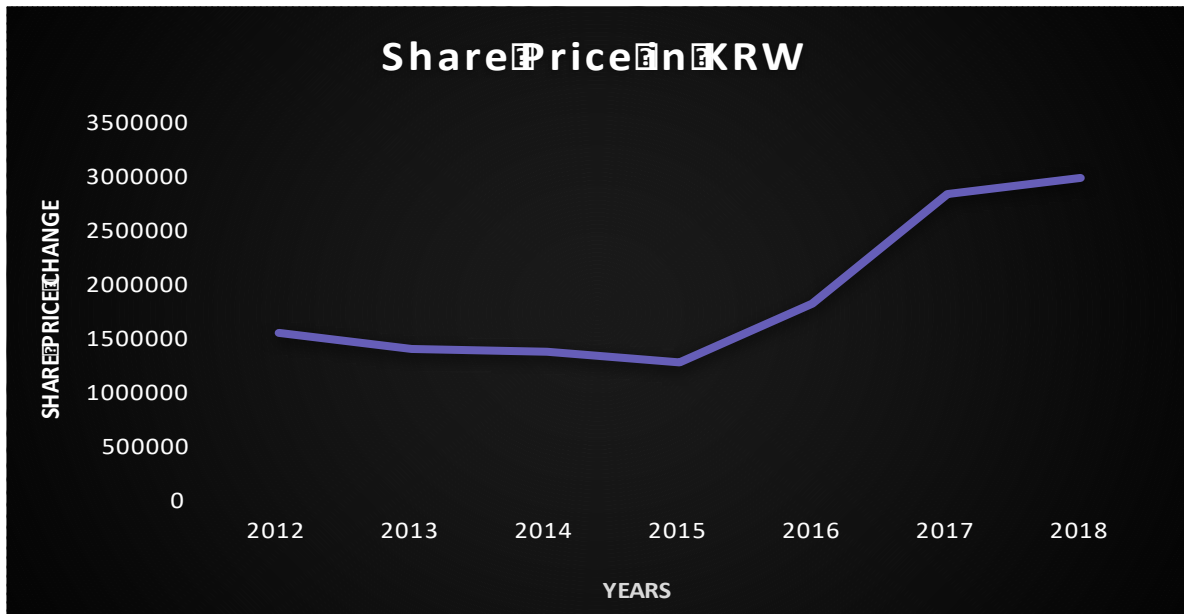
**Table 21: Dividends per share – Samsung Co., Ltd (on September, 27)**

Year	Dividends per share in KRW
2000	500
2001	4,000
2002	5,500
2003	5,500
2004	10,000
2005	5,500
2006	5,500
2007	8,000
2008	8,000
2009	8,000
2010	5,000
2011	5,500
2012	8,000
2013	3,800
2014	20,000
2015	21,000
2016	28,500
2017	27,500
<b>2018</b>	<b>30,882.5</b>
<b>2019</b>	<b>34,742.84</b>
<b>2020</b>	<b>39,050.952</b>
<b>2021</b>	<b>43,893.27023</b>

*Source: own calculations, data from: YahooFinance, Historical data, 2017*

## 4.2.4 Share Price

Figure 10: Share price – Samsung Co., Ltd (on October, 15)



Source: own processing, data from: Bloomberg, 2017

The graph below showing historical share price of Samsung during the six years and one predicted year. In the year 2012, the price was equal to 1,522,000 KRW. It has been decreasing until year 2015 and was 1,260,000 KRW. After that, it increased to 2,820,000 KRW in the year 2017. If compare this six years it is visible that share price increased by 1.85 times. There was done prediction by the model using the growth rate of 12.4 %, that in the year 2018 share price will increase by 145,965.41 KRW at a minimum, which means it will be equal approximately to 2,966,965.413 KRW. This prediction showing an average increase of share price and prediction for the beginning of the year 2018, there is a possibility that till the end of year price can extremely increase if there will be some innovative, successful product of company Samsung that will appear in the market. As well it is possible that share price will decrease during the year 2018.

## 5. RESULTS AND DISCUSSION

In this chapter will be described the results of economic analysis of Samsung Co., Ltd. Before in practical part there was done an estimation of different models in order to understand if the company is overvalued or undervalued.

Economic analysis was done by using dividend discount model. For observation was chosen period from 2000 till 2017. The data for analysis was collected from annual

reports of Samsung Co., Ltd. In the dividend discount model, there was chosen Constant-growth model for estimation of the dividends of company. The growth rate was calculated from the last 18 years and as the result of 72.3% was too high for using it in the model. It was connected with that company had extremely big increased in its dividends, as from 2000 till 2017 dividends grew by 27,000 KRW. In order to avoid the risk of such high rate, there was done decision to take smaller period, only four years. The new growth rate was calculated from year 2014 till 2017, as in these last year dividends are more stable. From 2014 till 2017 dividends grew only by 7,500 KRW and new calculated rate is 12.4%, which is 5.8 times smaller than previous one. By using this rate there was done calculation of the share price and the result was not so good, as current price of share is 2,820,000 KRW and price calculated by the model is 309,100 KRW, which is 9 times smaller.

Variable-growth model is used to recalculate the share price of the company. Based on previous calculations of growth rate which was equal to 12.4% and the calculated required return is 13.4% was done prediction of future dividends for the next four years. The prediction was done through the future value, and in the year 2018, the dividend is expected to grow by 3,382 KRW. In 2019, it will grow as well to 34,742.84 KRW and in 2020 it is going to grow to 39,050.952 KRW. So, from 2017 till 2021 it is going to grow by 16,393.27 KRW which is a great expected growth for shareholders. According to this model, the predicted stock price is going to be 3,121,168.1 KRW in 2018, which is higher by 301,186.1 KRW from the current price.

Price to earnings multiples model involved determining a six-year price target based on a reasonable, historical valuation. There was done an observation on earnings per share from 2012 till 2017. The highest earnings per share are now in the year 2017 as the value is equal to 229,391.51 KRW in comparison to the lowest one that was 126,254.48 KRW in 2015. The price to earnings ratio showed the best result in 2017 as well. It is equal to 12.29. In current year earnings per share of the company is covered 12.29 times by the market share. If compare it with the year 2013, \$1 of earnings had a market value of \$11.42, it was less by \$0.87. Expected earnings per share were calculated using the growth rate of 12.4% and in the year 2018 it will be equal approximately to 297,819.95 KRW, it is 1,29 times higher in comparison to the year 2017. It is determined by this model that company is currently undervalued as share price calculated by the model is 2,896,484.73 KRW, means that is higher by 76,484.73 KRW from the current stock price.

Price to earnings to growth rate ratio provides an estimate of Samsung's value. For the calculation of growth rate was taken percentage change of net income during the last 8 years. From 2010 till 2017, net income of company Samsung increased by 1.87 times, from 15,799,035,000 KRW to 29,614,445,000. The growth rate calculated for this period is equal to 9%.

There was calculated 6 PEG ratios, for each year separately. The result shows that during 2012, 2012, 2016 and 2017, the PEG ratio was higher than 1, that means that investors should seek undervalued shares. In 2013 and 2014, the Peg ratio of the company was smaller than 1 and was equal to 0.78 and 0.78. This means that shareholders should avoid undervalued shares. In order to predict future peg ratio, there was done an estimation of future net income for the year 2018. The future value of net income calculated through the growth rate of 9%, give an increase in net income by 2,054,040,434 KRW and the expected net income in the year 2018 is equal to 31,668,485,434 KRW. And the estimated stock price gave the result of 2,966,965.413 KRW, which is higher than current price by 146,965.41 KRW. The expected peg ratio is going to be 1.1, which is higher than 1, and it can be concluded that shareholders and potential investors should seek undervalued shares.

In the discounted free cash flow model, there was done a valuation of the firm's expected free cash flows, not firm's expected dividends. For growth rate, there was taken historical data of the companies FCF from the year 2012 till 2017. The growth rate was equal to 28.4%, which is not small rate and as previously was mentioned in the same situation when there was done the calculation for the growth rate of dividends, to be secure in making a future prediction it is better to take smaller growth rate. So afterward there were done recalculations for the new growth rate is 7%, taking into consideration smaller period of 4 years, from 2013 till 2016, as during this period the free cash flow is more stable. The highest FCF was in the year 2016 and 2013, was equal to 22,195,003,000 KRW and the lowest on in the current year is 10,961,572,000 KRW. The expected FCF in next 5 years is going to increase by 4,412,599,780 KRW. To determine the value of common stock there were done calculations of the value of an entire company, which includes itself all assets, is equal to 534,907,004,170.89 KRW and market value of debt, which includes short-term plus long-term debt, is 14,049,569 KRW. This model shows that company is undervalued, as share price that was calculated by the discounted cash flow model is 4,491,829.67 KRW and current stock price is smaller by 1.6 times. The result can be interpreted as it is a good chance to invest to a company Samsung Co., Ltd.

There was done calculations of book value per share for the company. There was take in consideration total shareholder equity and shares of common stock for last six years. The highest shareholder equity is in the year 2017, which is equal to 171,247,000,000,000 KRW and the smallest amount of shares of common stock was in 2017 and is equal to 129,100,000. The book value in 2017 is equal to 1,326,467.85 KRW, that is, of course, the highest book value over the historical period. If compare with the lowest one that was in the year 2012, it was 1.8 times smaller and was equal to 723,025.893 KRW. So, if in 2012 company were liquidate than a shareholder would receive 723,025.893 KRW. If it happens in 2014, the holder of common share would receive 980,072.2291, means that holder would receive 1.3 times more than in 2012. And if this happens in a current year, holder gets 1,326,467.85 KRW.

## **6. CONCLUSION & INVESTMENT RECOMMENDATIONS**

From the foundation of Samsung in 1969 in the city of Suwon, the company has become the world leader in the technology of information, controlling more than 200 affiliated companies in the world. More than a decade ago, the corporation was not perceived seriously as the rival of other corporations in the industry. Nowadays, Samsung Electronics is corporation that has a multinational innovation technology, and it became the most powerful company in its sector and as well one of the most profitable companies in the world.

In 2015-2016, it keeps up to date and actively develops virtual reality and tries to introduce the latest innovative technology. Now the offices of the company are located in more than 60 countries of the world. Samsung has manufacturing facilities in Portugal, Mexico, Hungary, China and Thailand, and the South Korean city of Suwon, where the company's headquarters is located, has long been called the "Samsung City" informally.

The company is a paragon of financial stability. After the launch of Samsung Galaxy S7 and Galaxy S7 Edge smartphone bestsellers, the company earned \$ 4.56 billion in January through March 2016, up 13% from a year earlier, with a turnover of about \$ 254 billion. By 2020, Samsung is striving to achieve an annual sales turnover of \$ 400 billion, while ensuring Samsung Electronics ranked among the top five global leaders in terms of the total brand value. In addition to its direct activities, in our time the Korean company Samsung is making considerable efforts to change and improve the world, protecting the environment, supporting culture and sports, as well as developing social programs. Today,

it's pretty hard to find an area where Samsung's brand would not meet, and it seems that this is just the beginning.

Samsung is registered on the Korean Stock Exchange, where its stock has been grown by 24% during last year. At the same time Apple stock has lost 19% of the cost. However, many other international companies registered in their countries, Samsung does not belong to any of the US stock exchanges. Samsung allocates revenues to Apple. It has 221,000 heads, and more than three times employees. It acts on a lot of different markets and even more than Apple does. Moreover, company Samsung as well makes a lot of different electronic devices, home instruments, TVs, stereo equipment, chips for computer, video-cameras. It's already huge in China as well. This makes a record profit - in 2016, the third quarter earnings Samsung grew by 91% to \$ 5.9 billion.

The main objective of this thesis was to evaluate the efficiency of the financial and economic activity of Samsung Co., Ltd, which was provided. By economic analysis, it is clearly understood that Samsung Corporation occupies an important position in comparing with relative companies. These days it is proved that Samsung Co. Ltd. is a popular company among its competitors, by producing a big variety of different kinds of products with new designs and its innovations. Thus, it leads to huge amount of customers and high profit. Another aim was to evaluate market share of the company on the global market of smartphones, further to analyze past data in order to forecast the future price changes of Samsung stock and to use it for future prediction, which was done as well. Afterward to estimate if company undervalued overvalued and based on that were provided recommendations whether to invest in a company or not.

According to the results of an economic analysis, it was determined that revenue of the company has increased over the last six years by 36,888,745 KRW and became 201,866,745 in the year 2016. As well the company has expanded in the market of smartphones and took the first position on the selling of phones in the year 2017 within 20% of the world market share. From 2016, sales increased by 3.1 %, and the company sold 78,671.4 smartphones in this year. There was done analyzing of historical data in order to make a future prediction, based on that the share price of Samsung has been increased over the years by 1,298,00 KRW, over the last six years and there was done prediction by the model, that it is going to grow in 2018 as well. The expectation is that it will grow by 145,965.41 KRW at a minimum, which is a good sign for potential investors to buy shares, in case if the stock price is going to grow next year. There was analyzed past

data of dividends for last 18 years. The results are impressive because from the year 2000 till 2017 dividends grew from 500 KRW to 27,500 KRW, which is 55 times more. This is a very good result for shareholders of course, because if the stockholder bought shares 18 years ago, now shareholder could get/sell it by 55 times more and higher. By the discounted free cash flow model – the company is undervalued, because the current share price is 2,820,000 KRW and share price calculated by the model is 4,491,829.67 KRW. As final, it can be concluded that all these investigations that were provided by analyzing and using different stock valuation models proved that company Samsung is worth to invest in.

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## 9. APPENDIX

### Income Statement

Period Ending	Dec 31, 2016	Dec 31, 2015	Dec 31, 2014	Dec 31, 2013
<b>Total Revenue</b>	201,866,745,000	200,653,482,000	206,205,987,000	228,692,667,000
Cost of Revenue	120,277,715,000	123,482,118,000	123,482,118,000	137,696,309,000
<b>Gross Profit</b>	81,589,030,000	77,171,364,000	77,927,187,000	90,996,358,000
Operating Expenses				
Total Operating Expenses	172,626,073,000	174,240,040,000	181,180,916,000	191,907,654,000
<b>Operating Income or Loss</b>	29,240,672,000	26,413,442,000	25,025,071,000	36,785,013,000
Income from Continuing Operations				
Earnings Before Interest and Taxes	29,240,672,000	26,413,442,000	25,025,071,000	36,785,013,000
Interest Expense	-587,831,000	-776,511,000	-592,940,000	-509,658,000
Income Tax Expense	7,987,560,000	6,900,851,000	4,480,676,000	7,889,515,000
<b>Net Income</b>	22,415,655,000	18,694,628,000	23,082,499,000	29,821,215,000

### Balance Sheet

Period Ending	Dec 31, 2016	Dec 31, 2015	Dec 31, 2014	Dec 31, 2013
<b>Assets</b>				
Current Assets				
Cash And Cash Equivalents	32,111,442,000	22,636,744,000	16,840,766,000	16,284,780,000
Short Term Investments	56,049,330,000	48,842,298,000	44,962,655,000	38,171,930,000
Net Receivables	27,800,408,000	28,520,689,000	28,234,485,000	27,891,383,000
Inventory	18,353,503,000	18,811,794,000	17,317,504,000	19,134,868,000
Other Current Assets	3,612,938,000	2,832,568,000	4,444,023,000	6,804,360,000
<b>Total Current Assets</b>	141,429,704,000	124,814,725,000	115,146,026,000	110,760,271,000
Long Term Investments	12,642,160,000	13,608,828,000	17,899,970,000	12,654,995,000
Goodwill	1,343,580,000	910,539,000	739,576,000	560,534,000
Deferred Long Term Asset Charges	5,321,450,000	5,589,108,000	4,526,595,000	4,621,780,000
<b>Total Assets</b>	262,174,324,000	242,179,521,000	230,422,958,000	214,075,018,000

<b>Liabilities</b>				
Current Liabilities				
Accounts Payable	6,485,039,000	6,187,291,000	7,914,704,000	8,437,139,000
Short/Current Long-Term Debt	15,282,386,000	12,873,963,000	11,265,519,000	11,160,533,000
Other Current Liabilities	21,712,150,000	21,309,906,000	21,414,466,000	22,669,392,000
<b>Total Current Liabilities</b>	<b>54,704,095,000</b>	<b>50,502,909,000</b>	<b>52,013,913,000</b>	<b>51,315,409,000</b>
Long-Term Debt	1,237,653,000	1,424,046,000	1,379,871,000	2,213,783,000
Deferred Long Term Liability Charges	1,180,618,000	1,697,545,000	1,239,933,000	752,669,000
<b>Total Liabilities</b>	<b>69,211,291,000</b>	<b>63,119,716,000</b>	<b>62,334,770,000</b>	<b>64,059,008,000</b>
<b>Stockholders' Equity</b>				
Common Stock	5,301,407,000	5,301,407,000	5,301,407,000	5,301,407,000
Retained Earnings	193,086,317,000	185,132,014,000	169,529,604,000	148,600,282,000
Treasury Stock	-11,963,396,000	-17,556,654,000	-12,649,286,000	-9,459,073,000
Capital Surplus	65,127,000	72,944,000	77,682,000	82,402,000

## Cash Flow

Period Ending	Dec 31, 2016	Dec 31, 2015	Dec 31, 2014	Dec 31, 2013
<b>Net Income</b>	<b>22,415,655,000</b>	<b>18,694,628,000</b>	<b>23,082,499,000</b>	<b>29,821,215,000</b>
<b>Operating Activities, Cash Flows Provided by or Used In</b>				
Depreciation	19,964,392,000	20,323,331,000	17,657,343,000	16,134,778,000
Changes in Accounts Receivables	1,473,776,000	207,676,000	-177,409,000	-1,993,705,000
Changes in Inventories	-2,830,602,000	-2,616,203,000	266,961,000	-3,097,762,000
Changes in Other Operating Activities	-24,367,000	-402,330,000	-3,660,790,000	4,743,899,000
<b>Total Cash Flow from Operating Activities</b>	<b>47,385,644,000</b>	<b>40,061,761,000</b>	<b>36,975,389,000</b>	<b>46,707,440,000</b>
<b>Investing Activities, Cash Flows Provided by or Used In</b>				
Capital Expenditures	-24,142,973,000	-25,880,222,000	-22,042,943,000	-23,157,587,000
<b>Total Cash Flows from Investing Activities</b>	<b>-29,658,675,000</b>	<b>-27,167,787,000</b>	<b>-32,806,408,000</b>	<b>-44,747,019,000</b>
<b>Financing Activities, Cash Flows Provided by or Used In</b>				
Other Cash Flows from Financing Activities	-5,164,526,000	-1,233,274,000	-10,972,450,000	-21,799,722,000
<b>Total Cash Flows from Financing Activities</b>	<b>-8,669,514,000</b>	<b>-6,573,509,000</b>	<b>-3,057,109,000</b>	<b>-4,137,031,000</b>
Effect of Exchange Rate Changes	417,243,000	-524,487,000	-555,886,000	-330,070,000
<b>Change in Cash and Cash Equivalents</b>	<b>9,474,698,000</b>	<b>5,795,978,000</b>	<b>555,986,000</b>	<b>-2,506,680,000</b>