



# The relationship between the profit warning and stock returns: Empirical evidence in EU markets

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## Abstract

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Following the development of the financial market and improvement of financial system, more regulations and rules were published to supervise the companies' behavior and furthermore protect the investors' interests. The disclosure of the profit warning is one approach for the companies to deliver the company's information to the public, thereby reducing the information asymmetry and keeping transparent. When the company's forthcoming earnings will not reach the previous expectation earnings, it will disclose a warning announcement about the below-expectation earnings to the public. Not like the earnings announcement, the profit warning is unrealized information. In other words, the profit warning is considered with the estimated earnings instead of the real financial results the company did. However, we are interested in and examine the event of the profit warning because it is earning-related and market value-relevant information and possibly elicits significantly negative market response. Normally it leads to the decrease of the companies' stock price.

There are several studies on profit warnings in US and UK markets. It was 1994 and 2000 that the warning announcement became mandatory to disclosure in UK and US respectively. Previous researchers within US and UK found stock price significantly declined following the profit warning. However, there is few studies targeted EU area. Therefore, the main purpose of this thesis is to examine whether the profit warning influences the stock prices within EU area from January 2008 to April 2010. Since there are two types of the profit warning (quantitative and qualitative), we also test whether different type of warning announcement will bring the different impact on the stock prices. Furthermore, we examine whether the impact of the profit warning is different according to the companies' size.

We collect 87 companies which disclosed the profit warnings in EU during twenty-eight months. During this period the many firms in the Industrials and Consumer Goods and Services are issued the profit warnings and United Kingdom and France were the countries which firms are issued most of the profit warnings.

Through event study method, we draw a conclusion the profit warning did influence the stock returns in the EU area. In addition, the qualitative warnings bring more negative effect on the companies' stock returns than quantitative ones. Sizes of the companies did not show different impact on the stock returns.

Key words: the profit warning, the stock price, the profit warning and stock return, EU area.

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## 1. Introduction

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*In this chapter, we show the readers a brief background about our topic, and research questions and purpose. Moreover, the delimitation of our research and our thesis's disposition are introduced in this chapter.*

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### 1.1 Problem background

Investors who participate in the capital markets expect that their investment will bring a high return in the future which will compensate for the related risks and expenses. Thus, they evaluate the investment; they calculate the benefits and the costs at the same time, which is the net present value calculation. However, firms that sell their shares to investors will receive more funds if stock prices are high, so that these firms can grow and produce values or assets in the economy (Penman, 2009, p.9-11; Bodie, Kane, & Marcus, 2009, p.5). The stock prices play a signaling role in the distribution of the economic resources from investors to firms. (Fama, 1970, p.383) From a broader perspective, in order to efficiently allocate the funds in society, it is important that the stock market valuation process and prices is correct (Arnold, 2008, p.567). The incorrect value of the stock today or tomorrow can be harmful in ten or twenty years and therefore impact the economy and society in terms of uneven allocation of resources. Today's and tomorrow's lower or higher than true value of the stock can be harmful in ten or twenty year's economy and society in terms of asset allocation thus value creation. (Arnold, 2008, p.567; Shiller, 2000, p.34).

In allocating the capital effectively and productively, the transparency should exist in the market so that investors will make a rational, well-informed decision. If a firm misleads the investors about the future prospect of the firm it will be difficult for investors to make such decisions (Bodie et al., 2009, p.9). Therefore, information disclosures from the firm are essential in order to make a correct decision in valuing a stock, thus allocating capital optimally. Moreover, according to Fama (1970), if the market is efficient, all available information should reflect in the security price and the security price will move as soon as the new information comes to the market. In order to maintain transparency, companies disclose different types of information to communicate with the public, such as, the key operating performance indicators, borrowing and capital structure, and dividend payment. In this way, the investors will know the company's financial condition. The company's earnings are a main determinant of the stock price, because the earnings indicate the operational result of the firm and its future success. Therefore, companies are required to inform the investors about its performance. Earnings are presented to the public on a quarterly or yearly basis, often in the month following the end of each quarter. These months are January, April, July or October. If earnings reported are above or below the analysts' earnings estimates, it will be a surprise to the market. Consequently, if this earnings surprise is positive the share price will usually increase, or if it is negative the share price will



decrease. In order to avoid such drastic changes in the stock prices and to reduce the magnitude of the market reaction companies warn the public regarding the unexpected level of earnings. The content of the warning is that the company earnings will not meet the market expectations. This announcement is called the profit warning. It is an attempt to communicate the earnings disappointment from the companies to the investment community. As the information disclosure, the profit warning improves transparency, which may result in re-evaluation of the stock price thus enabling financial market participants to make the right choice.

The profit warning is an announcement released by and it reveals that the earnings will be lower than expected. Moreover, the earnings drop can be expressed in other terms, like net profits, sales, earnings before interest and taxes, and earnings per share (Elayan & Pukthuanthong, 2009, p.165). According to Clare (2001, p.104), the profit warning is an adverse outlook for the company's future earnings and profitability through the press, which is market-relevant information and might result in revising profitability expectations from financial agents. Holland & Stoner (1996, p.304) claimed that the profit warning is one of the events that make the companies reveal price-sensitive information to the market. The 1994 Criminal Justice Act defined price-sensitive information as information that can result in a significant effect on the price of securities if the public receives it. The London Stock Exchange 1994 Guidance on the Dissemination of Price-sensitive Information defined "price sensitive information will potentially have a significant effect on a company's share price". Furthermore, Holland & Stoner (1996, p.297-298) pointed out that the significant effect of information is related to the company's main financial performance aspects such as future earnings and profitability, borrowings and capital structure.

In the definition of profit warning, the earnings expectation is used to compare with the incoming earnings. If the incoming earnings will not meet the expected earnings, the company will publish the warning announcement to the market by press, conference, or on the company website. The Stock Exchange guidance in UK suggested "*Companies and their advisers should be aware of the market expectations built into the company's share price*". That is, earnings expectations affect the company's stock prices. The earnings estimates of companies are important for investors in the security market because investors assess the company's future income and profitability based on earnings estimates. Therefore, it impacts investors' decision of purchasing or selling the stocks. Holland & Stoner (1996, p.297-298) There are several approaches to find the earnings expectation. In Brown, Hillegeist, & Lo's (2006, p.11) article, the approach to obtain earnings expectations is depended on the consensus of analysts' forecasts calculated by First Call. First Call is a company that gathers real-time broker-sourced research and earnings estimates to form analysts' earnings expectation. The sources the First Call adopts are from the above 700 brokerage firms and the investment banks all over the world. Moreover, the earnings forecast are computed through nine critical data measures. Datta & Upinder (1993, p.566) claimed "*use the mean analysts' forecast as a proxy for the market expectation*". Furthermore, MacKinlay (1997, p.16) pointed out the

Institutional Brokers Estimate System (I/B/E/S) publish the mean quarterly earnings forecast which is adopted as market's earnings expectation. I/B/E/S collects and edits earnings forecasts from analysts regarding a large number of companies and then calculates and publishes the statistical report monthly. Reilly & Brown (2004, p.850) in their book identified that I/B/E/S includes many analysts' earnings estimates from 800 brokers covered over 18,000 companies among 52 countries, which sets up a database for free to check selected company's market earnings expectation in different global market conditions. The companies' earnings forecasts for the next fiscal year by analysts are changeable based on the performance of companies.

The profit warning is classified into two types: quantitative and qualitative. Literally, the quantitative warning is the warning announcement involved in the numbers, which provides the exact number of earnings estimate or interval. On the other hand, the qualitative one states or indicates that earnings will fall below the current expectations without offering a specific estimation of the new earnings. For example, firms prefer to employ these phrases to express qualitative warnings; unlikely to reach estimates, and, "significantly below estimate" Bulkley & Herrerias (2004, p.3). Skinner (1994, p.46) also wrote the management adopted quantitative announcement such as "point, range, and lower-bound forecasts" and qualitative one like "earnings will be down" or "earnings will be disappointing" to disclose bad earnings prior to the real earnings announcement. He called this disclosure "the earning-related disclosure".

The disclosure of the profit warning will influence brokers' and analysts' evaluation of company. Analysts will revise the previous earnings expectation based on the company's current operating conditions. Then the analysts might warn the company's shareholders and potential shareholders. The investors are concerned about the company's profitability and competitive power in the long-term after the company releases the profit warning, which might cause a negative market reaction. Thus the company's value will decrease, which may result in the increase of the cost of capital, lowering in the company's rating. Consequently, the company's circumstances become worse. When the company fails to meet the new expected earnings, the similar result occurs. It becomes a vicious circle. The disadvantage of keeping such transparency is that the company reveals their bad condition to the investors and the competitors. That will impact the company's reputation after the profit warning.

The profit warning disclosure results in a negative market response to warning companies. However, from the long-term perspective, it is helpful for allocating the capital efficiently, reducing the information asymmetry, protecting the interests of the investors, building the investors' confidence in the market and correcting the market expectation regarding overvalued firms. If there is regulation to disclose the profit warning, there will be less information asymmetry problem. Kasznik & Lev (1995, p.124) studied the regulated firms like banks and utility providers give reports to regulators, which indirectly inform the public. From these reports, the public will constantly obtain more detailed and timely operating information than they can obtain

from the quarterly financial reports. Thus information asymmetry is reduced.

Extensive research has been conducted on the profit warnings and its impact in UK and US stock markets in the 1990s and in the early 2000s. Skinner (1994), Kasznik & Lev (1995) and Bulkley & Herrerias (2004) investigated the event of disclosure of profit warning in the US market. Clare (2001), Helbok & Walker (2003) and Collett (2004) studied the relationship between the profit warning and stock prices in the UK. Helbok & Walker (2003) investigated the attitudes toward the profit warning disclosure in London Stock Exchange when the UK made it compulsory for the quoted companies to release the profit warning in 1994. They compared the companies' performances and market reactions before and after the new rule. Through these studies, negative market reactions were found. Moreover, the impact of the profit warning is different based on firm specific factors, such as size. Kasznik & Lev (1995), Bulkley & Herrerias (2004), Jackson & Madura (2003), Collett (2004), Francoeur, Labelle, & Martinez (2008), and Elayan & Pukthuanthong (2009) compared the different effects for large versus small firms following the profit warning. They divided the companies into large or small according to the total assets. All of them found that small firms were beaten more than the large firms. The market reactions following the profit warning is a complicated issue. Based on the Efficient Market Hypothesis (Fama, 1970), the market will respond to the new information rapidly. The profit warning will result in the movement of the stock prices, as soon as, the company releases it to the market. After the adjustment of the market, the security price can reflect the all available information in the market. No company will be overvalued or undervalued. However, in practice, the investors overreact or under react to the warning announcement, which is associated with the investors' behavior and the timing of the information.

If the profit warning causes a negative market reaction and it reveals the company's bad condition to the market, why are the companies still willing to disclose it? There are several main reasons. The first reason is, to prevent a significant decrease in the stock price. The management tries to prepare the investors for the earnings disappointment prior to the real earnings announcements and reduce the magnitude of the reactions. Therefore, they avoid the dramatic volatility of the company's value. The second reason, is to avert the legal liability and lawsuit cost. The company will face legal consequences if it fails to disclose the bad news. This might result in the loss of investment value for the stock holders. The third reason is to maintain the reputation in the market and sustain good communication with the public. The fourth reason is the cost of capital. If the company fails to disclose bad news, the investors might lose confidence in it. That will result in declining share prices, falling credit rating and liquidity problems, and ultimately in an increase in the cost of capital. The reason is the regulation. In some countries, it is compulsory for companies to issue the profit warning if the company's financial condition changes enough to affect the market value of the company. The violation of this regulation will result in legal consequences.

The above introduction demonstrates that the profit warning is a complicated issue. The

influence of the profit warning on the stock price and the company's value triggers our interest and attention to do research in this academic and practical area. There are several researches in this field but not in the European Union area as integrated and harmonized. Therefore we define there is a research gap in this geographical area on the profit warnings of the European companies thus develop our research question as following.

## **1.2 Research question**

The profit warning is considered as bad news by the market because it reveals the company's adverse future profitability and competitiveness. Therefore, it results in significant negative returns in the UK and US stock markets. There is no research that focused on the EU as integrated. However, there are several researches focused country by country within the EU area. Established in 1993, the European Union represents a single market and is one of the largest economies in the world. EU plays an important role in international trade, business, finance and economy. Since EU is harmonized and integrated, there are no previous researches that focused on the profit warning impact on this are. According to previous empirical researches on Efficient Market Hypothesis (EMH), some European countries' stock markets are efficient and the security prices are followed by a random walk. Therefore, based on the concept of EMH, the stock price will fluctuate immediately after the information of profit warning is disclosed. Then the information provided with the profit warning will be reflected in the stock price. Our research question is developed as:

Does the profit warning impact the stock returns in the EU area?

More in detail we want to split our main research question in three specific issues:

- 1.1. Does the profit warning create abnormal return during the announcement periods?
- 1.2. Is there any difference in the impact between the profit warning types, qualitative and quantitative warning announcements?
- 1.3. Is there any difference in the impact of the profit warning according to the firm size?

### **1.3 Research statement**

The profit warning is a complex event with advantages and disadvantages when it is issued; therefore, it is a challengeable consideration to the companies. As the companies can choose the type of profit warning them, they can alter the impact on the stock value. Moreover, firms of different sizes can also have different strategies of which the impact may not be the same. The economic power of the European Union is increasing and it plays an important role in the global financial market. Therefore, we believe it worth to do research covering this geographical area. In addition, there is no research conducted in this integrated area regarding profit warning. During the period of economic downturn the profit warning is issued more often than under normal economic conditions. Our research covers the period of global economic downturn. The profit warning was one of the common events in the financial world that impacted the stock value during this period that we can see often in the financial newspapers and magazines.

### **1.4 Research purpose**

Our aim is to analyze the information content of the profit warnings that are issued by firms in the European Union geographical area. Furthermore, if the profit warnings provide vital information to the market regarding the value of the firm, we want to know the impact difference between the profit warning types. Moreover, we investigate whether the profit warning impact differs according to the firm size.

### **1.5 For whom**

Our research will give suggestions to the companies' managers and investors in this field. The profit warning disclosure reduces the impact of surprise at the time of the real earnings announcement, because the profit warning prepares the market for the bad news. Since the profit warning may result in negative stock returns, the management can minimize the effect through selecting different types of warning announcements, such as quantitative or qualitative ones. At the same time, the companies delivering the announcement regarding the companies' condition are being more transparent to the public. Not only do the companies avoid a law suit, they might gain the trust from the public by issuing the profit warning. The investors can consider the profit warning rationally and make a wise investment strategy. Investors assess the company's value and the future profitability based on the analysis of the company's financial statements and industry environment. By having knowledge about the profit warning and its impact, investors might re-assess their investment decisions thus avoid overreaction or under reaction regarding the event of profit warning. Furthermore, some investors might benefit from the significant negative market reaction and take a speculative position right after the disclosure of the profit warning.

Previous researches regarding the effect of the profit warning on the stock returns

focused on the US and UK markets. There are no researches in EU that is an integrated market. In this union, some countries require companies to disclosure the profit warning and some do not have that regulation. The relationship between the profit warning and the stock return in EU is unknown. Moreover, there is no evidence or research result on which kind of the profit warning has more negative influence on stock returns in EU. We believe that the outcome of our research will make a contribution towards filling up the knowledge gap in this field.

## **1.6 Delimitation**

We will focus on the event of profit warning. In practice, there are a few events that can trigger the movement of stock prices. Both Kasznik & Lev (1995, p.115) and Jackson & Madura (2003, p.503) believe the announcements of corporate control changes will affect the stock prices and the profit warning is not the only information that results in the market reaction. These corporate control announcements include mergers, acquisitions, dividend changes and stock repurchase. If a company issues both a profit warning and corporation control change information during the same time, it is hard to distinguish which information has caused the impact on stock price. The effect on stock returns may be more complicated. Therefore, in our thesis, we try to avoid other corporate control issues and pay attention solely to the event of profit warning.

During our selected cover period, some companies issued repeated profit warnings. These subsequent profit warnings may affect the stock returns continuously thus it makes impossible to measure the real impact. Therefore we excluded those companies that issued more than one profit warnings within one quarter that is our event window. Normally, the repeated profit warning, such as second or third one, may trigger more negative respond than the first one.

Moreover, we will study the impact of profit warning only on the common stock out of the financial securities. We exclude the impact of the profit warning on derivative securities such as options and futures contracts. Bodie et al. (2009, p.4-5) stated the value of derivative securities are derived from the prices of other assets like bond or stock. As one part of the investment environment, derivatives can be employed to hedge risks. Therefore, derivatives play an important role in both portfolio construction and in the financial system. Since the profit warning results in the movements of stock prices, it will influence the prices of derivatives which are determined by stocks and other assets.

Furthermore, there are many indices within EU areas but not an integrated index for the whole of the Europe. Thus our choice of which index to use as benchmark becomes one limitation and we used our own judgment based on our research purposes. Stock market indices are categorized in many ways. Different indices focus on different fields, firms' size or some specific standard. Therefore, it is important to select the proper index to compare with the abnormal returns of the companies following profit warnings. As we

are studying the EU areas, we should choose an index which can generally represent European listed companies. Thus we select the Euronext 100 index which is provided by pan-European stock exchanges rather than some specific national index. Since Euronext consists of Netherlands, Belgium, France, Portugal and the United Kingdom, we simply select our samples from listed or traded stock in these stock exchanges.

## **1.7 Disposition**

We present briefly the structure and content of our work as following:

### **Chapter 1: Introduction**

In this chapter, we gave the readers a brief background of our topic, research questions, and purpose. Moreover, the delimitation of our research and our thesis's disposition are introduced in this chapter.

### **Chapter 2: Theoretical Methodology**

In this chapter, firstly, we present the reason for choosing this subject and the authors' backgrounds. Then, we discuss the general theoretical research philosophy, research strategies and research approaches. Furthermore, we present which ones we use and explain the reasons. The following part is our research design. Where and how to select sources is introduced in this part. Then it is followed by criticism to literature sources, theory selection and criticism.

### **Chapter 3: Theoretical framework**

In this chapter, the previous researches on the profit warnings are introduced to the readers to facilitate the understanding of the profit warning and the role of the profit warning disclosure in the financial market. Thereafter, we discuss some theories such as the efficient market hypothesis, CAPM, agency theory, and behavioral finance. These are the main relevant theories that we used in developing our research questions. Then, it is followed by previous empirical results on the impact of profit warnings in the stock prices. Based on the review of the previous literatures, we develop our hypotheses.

### **Chapter 4: Practical Methodology**

In this chapter, we present the practical method we employed to do our empirical study. We claimed where and how we get our data and explain our research method specifically. According to the research method, the readers will clearly know our analysis procedures step by step. Moreover, validity and reliability as the criteria of research are discussed.

## **Chapter 5 Empirical Study and Analysis**

In this chapter, the empirical results of the various statistical tests are presented and analyzed. We present a parametric and a non-parametric statistical test results that tested our hypothesis. These tests are performed for full samples and for subsamples according to profit warning type and the firm size.

## **Chapter 6 Conclusion and Recommendations**

In this part, the final results and our reflections on it will be presented as our conclusion. In addition, we will give some suggestions to the future research.



## **2. Theoretical Methodology**

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*In this chapter, firstly, we present the reason of choosing this subject and authors' background. Then, we discuss the general theoretical research philosophy, research strategies and research approaches. Furthermore, we present which ones we use and explain the reasons. The following part is our research design. Where and how to select sources is introduced in this part. Then it is followed by criticism to literature sources, theory selection and criticism.*

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### **2.1 Choice of subject**

We selected this topic due to several reasons. First of all the profit warning was one of the interesting corporate events that triggers public attention. The media emphasizes this event by publishing in the headlines and participants of the financial markets receive the information with great focus. The result of this news thus influences the action of the financial market participants. How and why this information is so important and influence the financial market is thus interesting and useful to understand in the business world. Furthermore, both of us are interested in finance and investment. We have learned finance courses in Umeå University, such as corporate finance and investment. Thus we want to apply for these financial theories and knowledge we studied into the empirical research thereby understanding them deeper. Compared to other investment instrument like financial derivative instruments, it is common to invest in common stocks. Therefore, we pay attention to our own domestic stock markets for several years. We detected many events can result in the movement of stock prices, such as stock splits, dividend announcements and so on. Among them, the profit warning is a fairly new event in the financial market. From the late 1990s, some listed companies gradually started to issue profit warnings before they published their earnings announcements. We intend to know whether the profit warning will result in the volatility of the stock return. Moreover, after we reviewed the related literatures in this field, we found the profit warning has an impact on the market value of the companies. Usually, it has a negative impact. For example, stock prices fell by 22% on average in the announcement window, a much larger initial response than those observed for other news events. (Bulkley & Herrerias, 2005, p.604) Therefore, it influences the investment strategies: buy, hold, or sell the stocks. As participants in the financial market, we are interested in studying the impact of the event of profit warning and its consequences in the market as this will help us improve our knowledge and investment skills.

### **2.2 Preconceptions**

Everybody who is interested in stock market will pay attention into the profit warning and react to the news as it appears the main highlight of the news. Especially during the last years of economic downturn, it appeared more often than normal period indicating

the general economic condition. It was our personal interest also that why the profit warning is important thus it grabs the attention of investors. What are the reasons of profit warning and its impact on the stock return are interesting from the personal and researcher's perspective. The experiences and the previous knowledge of authors will have impact on their research, such as the topic selection, the choice of theories and the approach to conducting analysis. According to Bryman & Bell (2007, p.712), business researchers should pay attention to reflexivity which is related to their values, experiences, habits, and personal beliefs and they should attempt to be objective in their research. Therefore, we will consider reflexivity and try to remain objective and not be biased in our research.

Both authors have working experiences of six to seven years in the field. Author Wang has working experience in the business field; author Tserendash has working experience in the development field. Our knowledge regarding the business world is based on prior knowledge that obtained through prior career. This knowledge will help us figure out the big picture of the business world, and to be objective and realistic in our research work. The authors of this thesis are students with an academic background in the accounting and finance studied at Umeå School of Business (USB). Mainly, our preconception comes from formal education in USB that helps to develop and deepen our knowledge and skills to a more advanced level. We adopted knowledge and theories studied from finance and accounting courses to do our research and answer our research questions. Through the financial courses, we know which theories are related to our thesis such as Efficient Market Hypothesis (EMH) and Behavior Finance. These related theories give fundamental support and guide for the whole research. Accounting courses teach us the ability to read the company's annual report correctly and collect reliable information in the annual report. We are well educated about the stock market through formal courses and personal experiences. Therefore, we believe that there will be no significant bias that interferes with our objectivity. On the contrary, our personal and educational background supported us in exploring our subject; profit warning effect in the financial world. We find that this research work will be an opportunity to broaden our knowledge regarding financial markets and will enhance our development as young professionals in this field.

### **2.3 Research philosophy**

The reasons for conducting research in the academic world is because there are many issues and subjects around us about which we have incomplete knowledge, and that need to be explored. Moreover, there exists the natural need to grow for human beings. In order to be accepted and valued as a significant contribution to the body of knowledge, the researcher should use scientific methods or approaches which will confirm the integrity, reliability and reproducibility of the research work. To be accepted by or convince others in the credibility of our own research we need to clearly state our research methodology and research philosophy (Remenyi, Williams, Money, & Swartz, 1998, p. 24-30).

The way we view the world influences our research. We use different research strategies, methods and priorities for our knowledge development process. It is because the way we view the world influences us and creates such variability in our research. This variability is framed in our research philosophy which is related to the development of knowledge and the nature of that knowledge. Main considerations of research philosophy are ontological and epistemological positions, which define our way of thinking about the research process and approaching the study of activity. (Saunders, Philip, & Thornhill, 2009, p.107-109)

Epistemology is concerned with what is the acceptable knowledge in a field of study (Saunders et al., 2009, p.112) and focuses on whether the social world can be studied using the same principles, procedures and ethos as in the natural sciences (Bryman & Bell, 2007, p.16). The main positions are positivism and interpretivism.

Positivism has the following main principles:

1. An observable social reality is preferred to be studied and only observable phenomena produce credible data. (Saunders et al., 2009, p.16; Remenyi et al., 2005, p.32)
2. The purpose of theory is to generate hypotheses that can be tested. The role of research is to test theories and to provide material for the development of laws (Bryman & Bell, 2007, p.16)
3. Research should be conducted in a way that is value free-in and objective. (Saunders et al., 2009, p.114; Bryman & Bell, 2007, p.16). The researcher is independent and should neither affect nor be affected by the subject of research.(Remenyi et al., 2005, p.33)
4. The end product of research is aimed to be law, like generalizations similar to those that are produced by natural scientists (Remenyi et al., 2005, p.32)
5. Positivism emphasizes quantifiable observations that are used for statistical analysis.(Remenyi et al., p.33)

The opposite position is interpretivism or what is sometimes referred to as phenomenological position (Remenyi et al., 2005, p.35) and has the following main principles:

1. It focuses on the primacy of subjective consciousness. Each situation is unique and circumstances and individuals involved are the main ingredients. (Saunders et al.,2009, p.119; Remenyi et al., 1998, p.34)
2. The researcher is not independent of the subject of research but is an intrinsic part of it. (Remenyi et al., 2005, p.34)
3. The world can be modeled, but not in a mathematical sense rather in a verbal, diagram, or descriptive model. (Remenyi et al., 2005, p.34)
4. The world is socially constructed. The researcher looks beyond the details of the situation to understand reality. The world is composed of a series of multiple

realities, each of which should be understood and taken into account. (Remenyi et al., 2005, p.35)

5. Humans are social actors. This emphasizes the difference between conducting research among people rather than objects. (Saunders et al., 2009, p.116)

Understanding of human behavior is the main ingredient of interpretivism to social science; explanation of behavior is the main ingredient of the positivist approach (Bryman & Bell, 2007, p.18).

Ontology is concerned with nature and relations of being (Remenyi et al., 2005, p.286), nature of reality (Saunders et al., 2009, p.110), nature of social entities (Bryman & Bell, 2007, p.22). All these are about what assumptions we make about the way in which the world works. There are two different points of view objectivism and subjectivism, which is sometimes called constructionism.

Objectivism is an ontological position that states that social entities confront us as external facts so we have no influence or reach (Bryman & Bell, 2007, p.22). According to Saunders et al., it portrays the position that social entities exist in a reality external to the social actors concerned with their existence. In business and management studies it is viewed in the example of the organization. The organization is independent from the objects, from the reality, that is external to the staff who works there. (Bryman & Bell, 2007, p.22).

The subjective view is that social phenomena are created from the perceptions and consequent actions of social actors. It is associated with the interpretivist philosophy that promotes to study subjective meaning and its actors in order to understand their actions (Saunders et al., 2009, p.111). Social phenomena and categories are not only produced through social interaction but they that they are in a constant state of revision. (Bryman & Bell, 2007, p.23).

Based on the above concept and nature of different research philosophies, we choose a positivistic epistemology for this thesis. According to Bryman and Bell (2007, p.16), positivism is an epistemological position which studies of social reality and beyond by employing natural sciences' methods. The purpose of the thesis is to examine the relationship between the profit warning and the stock return, the effect of different types of the profit warning on stock returns, and the effect of varying firm-specific factors on stock returns in EU. Under the positivistic philosophical approach, we set up the hypotheses on the basis of the existing relevant theories. Then these hypotheses are tested and confirmed or disproved by quantitative and statistical methods in order to answer the research questions and accomplish the research purposes. Remenyi et al. (1998, p.32) claimed the final result of such research can be applicable through the positivist approach. The results of this thesis will be applicable for EU market.

## **2.4 Theoretical research method**

### **2.4.1 Research approaches**

Research approaches are flows from research philosophy and are concerned with the link between theory and research (Bryman & Bell, 2007, p.7). According to Saunders et al. (2009, p.124), deduction are more used to positivism and induction to interpretivism, even though they considered there is potentially misleading and no real practical value. Where the theory guides the research and the purpose is to test the theory is considered a deductive approach, while where theory comes out from the research and the purpose is to build theory is considered an inductive approach. (Saunders et al., 2009, p.124). Another approach called abduction which has features in common with both induction and deduction, differs from the above approaches with its inclusion of ‘understanding’. Induction is based on empirical observations while deduction is based on logic. (Ghauri & Grønhaug, 2002, p.13) Abduction is based on empirical observation like induction; also it does not reject theoretical prepositions like deduction. (Alvesson & Sköldberg, 2009, p.3-4)

Out of the above research approaches we determine our research approach as deductive because we start with what is known about the profit warning and its impact on stock prices in terms of theoretical considerations then we deduces our hypotheses that will be empirically tested. (Bryman & Bell, 2007, p.11) The deductive approach is based on principles of natural science, looking for patterns and behaviors. (Saunders et al., 2009, p.117-118) In our research we will look for mechanisms and behaviors of companies and investors in connection to the profit warning announcement. The theories are the fundamental to start to do research. Existing theories including the efficient market hypothesis, capital asset pricing model, behavioral finance theories, and the agency theory are used for developing our hypotheses and data collection is done through the observation of stock returns. Then analyses are done using statistical methods and results are replicable to the general world.

### **2.4.2 Research strategy**

There are two distinctive forms of research strategies, qualitative and quantitative. Bryman & Bell (2007, p.28) a research strategy is a general direction to do the research and also explained the main differences between quantitative and qualitative research as below:

The quantitative method underlines quantification in data collection and analysis and always entails a deductive approach where testing theories is mainly employed. This method applies the practices and standard of the natural scientific model and positivism. It views the social reality as an objective reality. The approach analyzes the quantitative data through statistical methods whereby most probably obtaining an objective conclusion.

The qualitative method emphasizes words instead of quantification when collecting and analyzing data. This method mostly uses an inductive approach and focuses on the generation of theories. It prefers the way where individuals interpret their social world rather than the way of using the practices and standards of the scientific model. It views the social reality as an individual creation that is subjective. This approach analyzes the collection of qualitative data by using interpretative methods such as interviews.

**Table1. Fundamental differences between quantitative and qualitative research strategies**

	Quantitative	Qualitative
Principal orientation to the role relation to research of theory	Deductive; testing of theory	Inductive; generation of theory
Epistemological orientation in particular positivism	Natural science model,	Interpretivism
Ontological orientation	Objectivism	Constructionism

Source: Bryman & Bell. (2007). *Business Research Methods*. 2<sup>nd</sup> edition. Oxford: Oxford University Press. p28

In the research of the relation between the disclosure of the profit warning and stock returns, the quantitative method is commonly employed. For example, Skinner (1994), Kasznik and Lev (1995), Clare (2001), Helbok & Walker (2003), Collett (2004), Bulkley & Herrerias (2004). They collected daily stock prices as data to calculate the stock returns and consequently measure the degree to which the profit warning triggered the negative market reaction. They quantified the association between the profit warning and stock returns and tested the theories through statistical methods.

In our thesis, we will investigate the stock prices movement before and after companies release the profit warnings. Therefore, we need to collect the profit warnings among listed companies in EU area and corresponding stock prices information during the estimate window and during the event window. By applying statistical tools and financial models, we analyze the impact of the profit warnings on the stock prices. Since quantitative research emphasizes quantification and number analysis and has the quality of positivism, we choose quantitative research as the research strategy in our thesis. The qualitative method is not suitable for our research because the data is normally collected through interviews. However, in our research, we need to collect the daily closing stock prices and calculate the abnormal returns. The method of the interview will not help us to gather complete and correct data, and furthermore test the theory in order to answer our research questions and achieve the research purpose.

## 2.5 Research Design

In the researches with purposes of analyzing the impact of any event on the security prices, the event study method is commonly used. Event study is the methodological approach to market based empirical research. The assumption of the event study is that the rational marketplace prices of the asset respond to the new information. In order to capture the response from the market, asset price behavior around the time of the event is analyzed, using financial market data (Bowman, 1983, p.56; Mackinlay, 1997, p.13). An advantage of the event study is that the event has an immediate impact on the asset price thus it can be measured with observation of shorter time periods in comparison with the direct measure method which need longer time period observations. The event study is used in many areas including law, economics, accounting and finance area, and it covers a variety of events. In the case of application in the accounting and finance, firm specific and economy wide events are studied, while analyzing the price of common equity (Mackinlay, 1997, p.13). For example events that are usually studied are announcement of annual accounting earnings, new debt issues, large block trades, mergers and acquisitions (Ruppert, 2004, p.180). If the event has an impact on the security price it will be measured through abnormal return (AR) which is the difference between actual return and expected return. As it involves measuring the abnormal return, sometimes event study is called as residual analysis, abnormal performance index test. (Bowman, 1983, p.561). Event study looks at the prices of a stock both before and after a new announcement about the stock. Then market should react immediately to the new information and then slowing down or stop reacting, according to the efficient market hypothesis. (Ruppert, 2004, p.437).

We used the event study method in our research, as it is the method which focuses on the effect of an event on the price of the security. It enables to observe the profit warning impact in the short period window, moreover, profit warning is surprise event that create immediate response from the market. Previous researches conducted regarding the profit warnings have used similar methods. For example, Bulkley & Herrerias (2005), Jackson & Madura (2003), and Collett (2004) all studied subjects related to the profit warnings using the event study method.

The event study has several steps and we will introduce these several steps in the following practical methodology part. Initial step of the event study is to select the event to be studied, and then the event windows need to be determined. The event window is the period of time that objects of the event will be studied. For example, the event window for the study of profit warning impact on the stock price can be the actual profit warning announced day of after the event days which is post-event window (MacKinlay 1997. p14). When measuring the impact of the stock price due to the event the abnormal return is used. After calculating the abnormal returns (ARs) and aggregated ARs as cumulative abnormal return (CAR), statistical parametric and non-parametric methods of comparing the groups are used to analyze the impact in detail. For example, to test our main hypothesis as profit warning does not create abnormal return is tested with a one sample t-test; to compare the impact difference between the profit warning types

independent t-test, to compare the impact differences between subsamples regarding the size ANOVA tests are used. The results of all these tests will be presented below. The non-parametric Wilcoxon Signed Rank test and Kruskal-Wallis tests are used for testing the second and third hypotheses and results are presented accordingly.

## **2.6 Literature Search and Critique**

### **2.6.1 Selection of sources**

According to Saunders et al. (2009, p. 68-69), there are three categories of the literature sources, namely as primary, secondary, and tertiary sources. The secondary literature is easier to find than the primary literature. The abundant secondary literature is available on the Internet. Therefore, in our thesis, we employ second literature to help us to answer our research questions and meet our research purposes. The secondary literature sources include books, articles and journals which are found through the Umeå University Library and its databases.

In order to find and review previous research on this topic, we mainly use online databases at the Umeå University's library like Business Source Premier (EBSCO) and Emerald. Hair, Money, Page, & Samouel (2007, p.100) argued that it becomes much easier to locate sources with the development of information technology and all libraries provide online computerized systems for users to find published work such as abstracts or even complete texts of articles. We also find articles from Google Scholar which offers a wide range of published articles. Saunders et al. (2009, p.70) identified that for any research, journals are an important literature source. It is easy to access the articles in journals and it is possible to get them via online access. Therefore, most of our literatures related to our research area are found from Umeå University's database (EBSCO) which provides enough, relevant, current and up-to-date sources for our research.

After finding these search tools, we needed to decide the key words to search relevant literature. We used the following key words:

*“The profit warning  
The warning announcement  
The earnings announcement  
The profit warning and stock returns  
The profit warning and stock prices  
The profit warning and EU companies  
Efficient Market Hypothesis  
Behavior finance  
Capital Assets Pricing Model (CAPM)”*

We entered these key words into the research engines and then a large number of



literatures were available online. After that, we read through the abstracts of these articles and narrow down the sources associated with our study. Moreover, we employ the books to find relevant research methods to use in our thesis, as well as key academic theories related to our research. Through ALBUM of the Umeå University Library, we found books for the methodology and literature review part of our thesis. Saunders et al. (2009, p.73) stated the books' advantage is "*the material in books is usually presented in a more ordered and accessible manner than in journals, pulling together a wider range of topics*" and books help to clarify research questions and research methods. However, in the meantime, we should keep in mind some out-of-date material is probably contained in books. Furthermore, in order to collect variables we used the annual reports of the sample companies from their websites.

### **2.6.2 Criticism to secondary literature sources**

According to Saunders et al. (2009, p.92-93), the next step is evaluating the literature after the literature is obtained. This process of assessing the literature is determined by the scope of our review and the value of the literature we chose. Therefore, the relevance and value of literature and the sufficiency of literature are the two most important aspects to assess.

First of all, the relevance of the literature we collect for our research is assessed based on our research questions. We use the key words to find existing literature, and then we classify these articles according to which are published in recent years and related to our research questions and purposes. These articles include the main academic theories and previous empirical evidence in our research field, and probably the contradictory conclusions to our study. These articles published in recent years show that our research is updated and provide contributions for the development of current theories in this research area. However, we chose some articles for our thesis which were published from the 60's to the 90's because they clearly show the readers the process of development in our research area. Especially, some articles were published in the 60's as main articles in our thesis. The reason is these articles play a vital role in the research field and are still cited by many researchers nowadays. For example, the article '*Efficient Capital Markets: A Review of Theory and Empirical Work*' by Fama in 1970, is cited 6384 times.

Secondly, Saunders et al. (2009, p.93) claims it is more complex to assess a sufficient amount. It is not possible to collect and read all articles in our research field. We managed to choose main writers in this field related to the topic "the impact of the profit warning on the stock returns" which put our research in the broader context, while further searches offer mainly references to the items, we have already read. This is a method that is based on Saunders et al. (2009, p. 93) However, in practice, we need to restrict our searching time period because new articles are published every day and new insights in our research field comes up continuously. At the same time, we make sure

we gather and collect information which is relevant, reliable and sufficient to our study.

### **2.6.3 Selections of theory and Criticism**

In this thesis, we choose several relevant theories as the academic base to guide our research and answer our research questions. In the next chapter, theoretical framework, we will discuss these relevant theories particularly that will be tested later.

Firstly, Random Walk and Efficient Market Hypothesis are chosen because they play an important role in the financial market. According to Fama (1970), the stock prices reflect all available information and the market responds the new information rapidly in the efficient market. Therefore, no stocks will be misprices and no companies will be overvalued or undervalued in this market. For example, if a company is undervalued, all investors want to buy the company's stock at low prices and sell it at high prices. Then the stock price of the company will increase because many investors flood to buy it till the price equals the real value of the company. Consequently, the information always is reflected in the stock price and no one can always earn abnormal returns. Based on the Random Walk, the stock prices are not predictable. However, this hypothesis has its own weakness. It is not completely tenable in practice since there are three assumptions regarding this hypothesis. For example, in the reality, it is impossible every investor knows all available information and the transaction costs in trading securities.

The random walk and EMH are followed by behavior finance theory in our research. Along with the development of the financial theories and the progress of the financial market, the random walk and EMH could not explain some phenomena in reality. Therefore, economists emerged the psychology into the financial market and started to explain the behavior of the stock price in relation to the psychological phenomena. Due to its impact on the stock price after the reveal, the profit warning is interesting event that has significant behavioral responses from the financial market participants

The next theory we discuss is the Capital Asset Pricing Model (CAPM). CAPM is one of the most important models in finance field when evaluating assets in portfolio. The linear relationship between risk and return is expressed by CAPM. However, like the EMH, the ideal assumptions of CAPM are criticized in the practice.

### 3. Theoretical Framework

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*In this chapter, the previous researches regarding the profit warning are introduced to the readers to help to understand the profit warning and the role of the profit warning disclosure in the financial market. Thereafter, we discuss some theories such as the efficient market hypothesis, behavioral finance, CAPM and agency theory. These are the main relevant theories that we used in developing our research questions. Then, it is followed by previous empirical results on the impact of profit warnings in the stock prices. Based on the review of the previous literatures, we develop our hypotheses in the end of this part.*

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We start this chapter introducing the concepts of the profit warnings extensively including the definition, types, and regulations regarding the profit warning, reasons of why firms issue the profit warning and its impact as in previous researches. Then we continue presenting the relevant theories in our research field. Firstly, the random walk and efficient market hypothesis (EMH) are introduced. The EMH is the one of the fundamental theories in finance. The random walk indicates the stock price cannot be estimated according to the past stock price. Moreover, the random walk is the basis of the EMH. If the stock market is efficient, the stock price can reflect all available information and the stock price can adjust rapidly as soon as the new information occurs. Being information, the profit warning will result in the movement of the stock price and finally the event of the profit warning will reflect in the stock price. We have intention to investigate whether the companies' stock prices change following the profit warnings and how fast they move. Thereafter, we choose the capital assets price model (CAPM) to calculate the estimated normal returns of sample companies. CAPM is the classic model to assess assets. With the development of the financial theories and markets, the EMH is challenged by some researchers since the EMH cannot be used to explain some economical phenomena, especially in financial crisis. Therefore, the behavior finance theory is introduced. The theory helps us to interpret some investors' reactions regarding the disclosure of the profit warnings. Final theory we cover is the agency theory. It helps to explain the relationship between the corporate governance and the profit warning and display the effect of corporate governance on the disclosure of the profit warning. Then we continue with previous research empirical results and firms specific factors that influence in the impact of profit warning. In this chapter, we introduced many previous researches because we want to make extensive review in our research field. We categorize our samples into different size and test the effect of the profit warning on them like what previous researches did. Even though some previous researches are not related to our study closely and directly, we still present them here. For example, we introduce previous researches about different effect of the profit warning on different industries and varying types of stocks such as value and growth stocks. One reason is we want to broaden our review. Another reason is we want to supply some useful information for further researches.

### **3.1 Profit warning**

#### **3.1.1 The definition of profit warning and related regulation.**

In order to determine the true value of firm, investors need credible, substantive, and timely value relevant information from firm. (Ogden, Jen, & O'Connor, 2003, p.132) Rules and mechanisms exist in the financial market to make such information available to investors. Disclosure rules are one way to reveal the information to market. Disclosures provide information to investors so that they rationally value the firm, as result market price of a firm could be efficient (Ogden et al., 2003, p.273).

As one form of information disclosure, profit warnings decrease the information asymmetry between markets and firms. It reveals the financial condition and result of the operation in advance of financial statement even though it has negative consequence (Eilifsen, Messier, Glover, Steven, & Prawitt, 2009, p.7). Firms share the information with market that they will not meet the market expectation regarding the performance.

Bulkley & Herrerias (2004, p.5) called the profit warning as unexpected corporate announcement which prescriptive forthcoming period earnings will decrease below current expectations. They (2004, p.2) also pointed out an important opinion that profit warnings are pure information rather than a decision that the firm makes according to the direct material consequences. Namely the profit warnings are not the realization, but are the news before a specific and imminent realization, the earnings announcement. Collett (2004, p.4) also categorized profit warnings into unscheduled announcements and claimed the profit warning is not actual results announcements. He investigated the market response to the scheduled and unscheduled announcements and identified unscheduled announcement resulted in greater reaction of market from 1995 to 2001, which is a bullish stock market conditions in UK. That means it was probably the good news dominated negative news in this period. Claude (2008, p.318) also defined the profit warning as an unexpected corporate announcement. Collett (2004, p.23,30) detected compared to the first profit warning, the second one will trigger more negative market reaction within half year period.

Different countries have varying regulation about this unscheduled warning announcement, the profit warning. In US, before August 2000, listed companies were allowed to disclose their profit warnings selectively. After that, the Regulation Fair Disclosure was adopted to prohibit the discretionary disclosures of information. In UK, since 1994, the Financial Services Authority (FSA) requires the listed companies on the London Stock Exchange (LSE) to issue trading statements when the company's financial condition or the performance of its business changes, which is likely to affect the company's market value. The company must disclose all associated information regarding the change to the Company Announcements Office without delay. It became compulsory to issue the profit warning in UK.

The European Commission regulated the Transparency Directive in 2007 in order to

achieve harmonization within European Union member states and protect investors' benefits. The Transparency Directive set out serial acts and requirements which the corporations need to follow when they issue information to the public. The requirements are tightly correlated with the judgments on corporation conditions and investors' investment decision. For example, there are some requirements relevant to periodic reporting, such as annual report, half-yearly reporting and quarterly reporting. European Commission insists the harmonization of transparency requirements on information issued by companies within EU area. However, it did not require every country within EU area to disclose the profit warning obligatorily. Individual EU countries have different rules regarding the profit warning. For example, according to Standard 5.2b Disclosure obligation of the issuer and shareholder, in Finland, "*a change in the issuer's expected profits, financial position or prospects shall be disclosed without undue delay if the change is likely to have a material effect on the value of the issuer's security*". In its neighbor country, Sweden, it is not compulsory to issue this information.

### **3.1.2 The firms' insights and why firms issue profit warnings**

There are some researches on this issue in US and UK market in the 1990s and in the early 2000s. These previous researches display results and contribution in this field.

The reasons, why firms issue profit warnings presented firstly. The disclosures from the companies contribute to reduce information asymmetry between the companies and investors and improve market transparency. Jackson & Madura (2003, p.511) pointed out the management deliver asymmetric information to investors when they disclose the profit warnings. As earnings-related and price sensitive information is released, the company prefer to publish the bad news rather than the good news. There are several related studies associated with it. Skinner (1994, p.39) identified there are at least two reasons for companies to tend to issue earnings-related warnings in the US stock markets; one is stockholders lawsuit and another is reputational costs. Elayan & Pukthuanthong (2009, p.174) agreed with this idea about releasing profit warnings to avoid shareholder lawsuits by "*material information in a timely manner*". Besides, Kasznik & Lev (1995, p.114) investigated the disclosure policy when managers confront a large earnings surprise and pointed out that managers fell in dilemma on disclosure policy for profit warnings and they do not know whether they should alert investors or keep silent prior to publishing earnings announcements. They (1995, p.115) identified that investors may interpret the profit warning as bad signal of long term competitiveness and economic viability of company that leads to substantial decline in stock price. They considered that maybe by this reason half of their sample firms did not submit any warning before earnings surprise. Companies were concerned with overreaction of investors. After investigation, Bulkley & Herrerias (2004) also obtained the same reason as Kasznik & Lev (1995), which managers do not want to release profit warnings is because they worry market will overreact to profit warnings through interviewing managers. They also found substantial negative average abnormal returns on stocks purchased two days after a profit warning and it lasts for the next three

months. Jackson & Madura (2003) study the profit warnings in the same time period and same market, and then found the similar result that profit warnings lead to a strong negative market response around the period of announcement. Helbok & Walker (2003, p.23) found news disclosed publicly brought more negative effect than the non-warning news before or after 1994 when LSE regulated the profit warning into the mandatory disclosure information.

In contrast, Holland (1997, 1998), Holland & Stoner (1996) investigated UK companies and found benefits of communicating price sensitive information privately instead of publishing profit warning to the public on the financial institutions, analysts and companies aspects. Firstly, they found through releasing private disclosure, the major shareholders and analysts can understand the company's performance and have strong confidence for the management. On the other hand, the company can increase the capability of financing and prevent a takeover. Secondly, they identified the responds of financial institutions and analysts to the profit warning are rapidly and correctly based on their professional knowledge and experience better than individual investors and finally cause the market reaction. It gives positive influence on market efficiency and avoids the market react to the price sensitive information under-reaction or over-reaction.

As an unexpected corporate announcement, the profit warning gives message to public with meaning of future earnings will not meet the current expectation of market. It informs the investors and shareholders about downward correction in expected result. (Claude, 2008, p.318). Therefore, it is unplanned or unscheduled and companies have their own discretionary in developing its timing and content. Most of the company management emphasize their responsibility regarding disclosing the price sensitive information, even though they are not forced to do it. They prefer to disclose bad news than good news and make it as earlier as possible (Skinner, 1994). Collett (2004, p.4) also detected many directors are serious about price-sensitive information disclosure even though the company is not followed by analysts. However, such decision will lead to dramatic price movement as it informs the public the company is performing poorly. Instead of disclosing the bad news they can choose to fail to disclose, delay the disclosure, disclose through private channel. (Hebok & Walker, 2003). Despite the negative consequence on firm valuation, firms choose to issue profit warning due to several motives that we will discuss below.

### ***Prevent from dramatic decline in stock price***

The primary intention to issue profit warning from the firms is they try to reduce the impact of the coming surprise earnings announcement by informing and preparing the investors. Thus they attempt to lower the market reaction in the stock price and avoid large stock price fluctuation (Kasznik & Lev, 1995, p.121; Holland, 1998, p.13). Profit warning gives information that firms expected cash flow may change, thus investors revise their expectation of cash flow and consider the decision of buy or not stock.

Changes in cash flow and earnings lead to changes in market valuation- stock price of firm. Moreover, it confirms indirect adverse signals in the market about the firm as there was other performance related information or tendency noted by market. Furthermore, it can indicate the general economic condition signaling the unpleasant atmosphere in the economy. It can be great surprise if there were no such signals in the market. As it corrects the market expectation it gives accurate information about earnings, as well as giving brief information about the reason for depressed earning. (Jackson & Madura, 2003, p.500).

### ***Legal liability and prevention from suit.***

Failure to disclose bad news or issue profit warning may have legal consequence as firms do not meet their promised earnings and take advantage of information asymmetry for not informing investors. (Skinner, 1994, p.7). The legal liability can vary depending on size of the firms, for large firms suit can be costly, for small firms due to settlement size it could not be considered into suit. (Holland, 1998, p.8). Profit warning can be the way to avoid such legal lawsuit as it corrects market expectation before the large earning surprise (Helbok & Walker, 2003; Holland, 1998).

### ***The reputation and communication***

Another motive to issue profit warnings is the firm's willingness to maintain the good relations with investors, moreover maintain its reputation and image in the market. Through good communication with investment community, firms can meet their demand for corporate financing and corporate control. Disclosures of the information are important tool of communication with investors especially those firms that are less followed by analysts or not listed in the stock exchange. (Holland & Stoner, 1996, p.7; Skinner, 1994, p.45). Particularly firms pay attention to maintaining good communication and relationship with institutional investors because they lead the rest of the market participants with their trading behavior. The rest of the market participants assume that institutional investors have superior information thus their trading behavior is rational, then they follow or reconsider their trading decisions in relation to analysis or behavior of institutional investors. Therefore, miscommunication with institutional investors may lead to overreaction in the market. (Holland, 1998, p.30) Moreover, being transparent can help in maintaining the credit rating and keeping the reputation on the labor market, and these can be external market pressure for being transparent. (Francoeur et al., 2008, p.319). Not only has the firm that has bad news wanted to disclose but also the firm that has good news wish to disclose information with another reason. Firms that have good news willing to inform the market with the intention to distinguish it from its competitors thus maybe raise the reputation among market (Skinner, 1994, p.45). The market appreciates the firm reputation for integrity as it is important in the long term relationship and thus it can give competitive advantage to firm. (Bodie et al., 2009, p.9).

### ***Increased cost in the cost of capital***

Holland & Stoner (1996) found price sensitive information is issued by companies to the public because of several market incentives. For example the companies might confront high cost of capital through share price reduction and liquidity reduction if they fail to disclose the bad news. Market makers widen the spread between buy and sell or increase the risk premium, while investors pay less for share or stop holding shares of the firm that did not disclose appropriate information. These impose the increase in the cost of the capital.

### ***Regulation***

The decision to issue profit warning is also influenced by features and regulations of the market. Due to its significant legal consequence, US firms are motivated by fear of being sued (Skinner, 1994, p.45). In UK, such motivation is not so strong instead its financial reporting pattern as semi-annual basis and institutional structure of ownership of firms are main drives of profit warning decision. As Institutional investors dominate in ownership structure of quoted firms they are active and their influence on market is strong that watching the firms carefully (Helbok & Walker, 2003). Even though the profit warning disclosure is compulsory in some countries, the company directors still have right to decide it by themselves. According to Collett (2004, p.5), the company directors can judge whether the news is price-sensitive information or not and whether it will bring a substantial price change or not through their own determination. Therefore, in an extent, the company can decide if it discloses the profit warning.

### ***Other motives and variables***

Among other motives of the issuing profit warning, there is interesting motive that is related to financial analysts that commented on the firm stock. As many firms are followed by financial analysts, analysts' estimation is expected to be rational and professional. However, in case of analysts estimation fails to match with firm performance they could be embarrassed or surprised. Investors who do not have professional knowledge about the financial market and price estimation are main customers of the financial analysts and they are majority of players of market. (Arnold, 2008) If the one that guides these investors provides wrong estimation, maybe in several cases, investors will lose the trust and confidence on analysts. Furthermore, as this field is very competitive and tough, analysts will be in difficult situation in front of other colleagues. Such embarrassment among customers and competitors may create the ill feeling to analysts and confidence loose or disappointment on firm's management can impose a heavy cost on firms. (Kasznik & Lev, 1995, p.121). Another motive that is related to managers own benefit. They have willingness to issue profit warning if it can help gain company control benefit, job security benefit, and reputation in the market for senior executives. (Holland, 1998, p.30).



Except for these main incentives to announce the profit warning, there are other variables that influence on the management decisions regarding issuance of the price sensitive information. Helbok & Walker (2003) mentioned them as: the permanence of the news, a desire to keep bondholders in the dark in the presence of higher levels of default risk, the level of director share ownership. If the news has permanent character that will continue for a while then managers want to issue profit warning. If the news is only temporary and it could be improved after some time then they hesitate to disclose information. Directors are reluctant to make decision to disclose the bad news as more they own the share of firm, (Skinner, 1994), while they are willing to announce good news with aim to influence positive stock returns to enhance the own wealth, (Holland, 1998). During the 1995-2001 bullish stock markets, the positive company news dominated the negative news. If firm issue more negative updates than positive it would suggest that they are motivated to minimize the legal and reputation cost of failure to disclose. If firm issue positive updates it represented the desire to influence positive stock returns as directors own wealth will increase. (Holland, 1998, p.30).

### **3.1.3 Classification of profit warning**

*In which way to issue profit warnings will bring less negative abnormal return? (Qualitative or quantitative profit warning?)*

Many previous researches indicated that the disclosure of the profit warning elicits the negative stock return. (Skinner (1994), Kasznik & Lev (1995), Clare (2001), Helbok & Walker (2003), Bulkley & Herrerias (2004), Collett (2004)) Since the profit warning has two different types, quantitative and qualitative announcements, whether they bring the same effect on the stock price or not.

The difference between the quantitative and qualitative warning is that the quantitative one contains one point or range earnings forecast for the forthcoming scheduled earnings announcement. Whereas, the qualitative one includes the qualitative guidance which shows earnings will fall below current expectations. (Bulkley & Herrerias, 2004, p.5) That is, the quantitative warning offers numbers regarding the earnings and the qualitative one just only present a downward tendency statement.

Kasznik & Lev (1995, p.114) claimed managers need to consider which forms of profit warning to be adopted in order to alert investors the bad incoming earnings. Should it be a specific earnings forecast or general production report? They identified quantitative form of profit warning as “hard” earnings forecasts and qualitative one as “soft” operating or product-related releases. They (1995, p.133) found less than ten percent of their sample issued quantitative warning while the half of the companies did not warn before their surprising earnings. Besides, they (1995, p.133) detected the companies more likely to issue quantitative form warnings if the incoming earnings surprises are large.

Bulkley & Herrerias (2004, p.5) investigated the content of the information regarding the two types of announcements to analyze the market's reaction by the announcement returns and post-event returns. Through using the statistical method, the evidence that different form of profit warning caused varying movement on stock price was obtained. After observation the chosen samples over three months, Bulkley & Herrerias (2004, p.4) found a qualitative warning results in significantly more negative post-event abnormal returns, -9.6%, than a quantitative warning about -2%. It claimed a qualitative warning is originally considered as worse news than a quantitative warning.

***Which kind of disappointment information do the companies want to release? (Permanent or transient?)***

Not only is the type of the profit warning different, but also the nature of disappointment information is varying. The nature of earnings disappointment can be permanent or transient. The permanent disappointment is a long-term consequence that causes the company's bad earnings. Whereas, the transient one is a short-term or temperate consequence for company's earnings surprise and it might be changed next quarter or next fiscal period.

Whether do the companies tend to release all natures of disappointment equally? Do they intend to issue permanent or transient information to the public? Kasznik & Lev (1995, p.133) pointed out the firms preferred to publish permanent earnings disappointment and largely keep transitory surprises silent before they surprise investors, which is one explanation approximate fifty percent of their sample companies to be unwarned for profit warnings. One explanation for this phenomenon is that the managers worry investors will raise anxiety about the long-term competitiveness and financial survival capability of the companies which results in overreaction to profit warnings. This explanation is similar as one result of examination what Bulkley & Herrerias (2004) obtained. However, Elayan & Pukthuanthong (2009, p.167) claimed if a profit warning just for quarterly earnings, the profit warning probably rapidly was associated with shareholders' welfare, rather than playing an important role in a long-term perspective for the companies Besides, Helbok & Walker (2003) studied the profit warnings in UK and found the companies are willing to warn related with the permanence of the news as well.

***How long do firms issue profit warnings before they disclose the earnings announcements?***

The company is willing to choose date to release bad news; therefore, the market may spend some time in digesting the news and take slow reaction about it. Namely, timing of issuing the information is an important consideration for the management. It might be result in different market reaction and then impact the value of company. Damodaran (1989, p.620) identified the weekend effect and Friday announcements and pointed out

if the company issued bad news on Friday after 4 pm, the stock market closed and the investors could not deal with their shares directly. Mendenhall, Nichols, & Palepu (1988) and Chen & Mohan (1994) also studied the timing of the announcement and detected selecting a proper time to disclose bad news plays an important role in reducing the negative market reaction. However, Elayan & Pukthuanthong (2009, p.173, 174) found the contrary result compared to the previous one on timing. At the same time, they detected the market did not react too negative if the profit warnings were disclosure relatively earlier and more than one time.

Bulkley & Herrerias (2004, p.25) made a list about time between the warning and the earnings announcement among 2013 samples from February 15<sup>th</sup> 1998 to December 31<sup>st</sup> 2000 in US financial market as follow.

**Table2. Time between the warning (quantitative and qualitative) and the announcement**

<b>Time between the warning and the announcement</b>	<b>Quantitative Warnings</b>	<b>Qualitative Warnings</b>
Less than 1 Month	44.06%	45.44%
1 to 2 Months	30.46%	39.60%
2 to 3 Months	10.79%	7.30%
3 to 4 Months	6.54%	3.28%
4 to 5 Months	0.84%	1.46%
More than 5 Months	7.31%	2.92%
	100.00%	100.00%

*Source: Bulkley & Herrerias. (2004). Stock returns following profit warnings. Working paper, University of Exeter, Xfi Centre for Finance and Investment and University of Exeter.*

It revealed most of profit warnings were released less than one month before publishing the real earnings announcement and the second most common time period of issuing profit warnings is between one and two months prior to the earnings announcements. Bulkley & Herrerias (2004, p.6) indentified that one determining factor for the accuracy of a firm's quarterly announcement information was the timing differences between profit warnings and earnings announcements They (2004, p.2,13) also detected about 90% of profit warnings among their samples were issued within three months before earnings announcements and almost 92% of companies among their 429 qualitative warnings samples have published earnings announcements less than three months of qualitative warnings. In addition, after issuing qualitative warnings most of the abnormal returns increased during the first three months and it implied the earnings announcement is a significant driver of abnormal returns.

Jackson & Madura (2003, p.511) claimed the market reacted significantly negatively to the profit warning which resulted in -14.72% of a mean two-day cumulative abnormal

return. Besides, they found no matter how early the company issued the profit warning before an earnings announcement, there are no different on the strong negative market reaction.

### **3.2 Random walk and Efficient Market Hypothesis (EMH)**

Fama (1970, p.383) pointed out that distribution of ownership of the economy's capital stock is the basic role of the capital market and he described how the efficient market should be. In that market, the firms have the right to make decisions on production-investment and investors can select the securities associated to firms' ownership under the assumption that prices are regarded as accurate signals to "fully reflected" all available information. The capital market plays an important role within an economy to allocate and price the capital; at the same time assess the risk. However, this ability of capital market is associated with market efficiency. That is the reason many researchers concentrated on study how the price information is processed or equally, quality and determination of stock returns. Ryoo & Smith (2002, p.475). Fama (1970) explained the efficient market where all available information can be fully reflected in the securities prices and also change fast to reflect new information. He reviewed both the theoretical and empirical literature on the efficient markets model and concluded the efficient market models are testable. The term of efficiency implies "informational" efficiency which is association between information and securities prices, rather than "production" or "exchange" efficiency. Ball (1994, p.4) Ball's (1994) insights were consistent with Fama's (1965) definition about efficient market, which information is the focus in that definition. Pettit (1972, p.994) stated all published and broad available information will be reflected in current prices completely without any bias in an efficient market. That means the previous available information will not affect the current return because that information has already reflect in previous prices. Moreover, he (1972, p.995) pointed out in one period actual return will outperformance or decline under the expected return by the movement of the security's price rapidly and unbiasedly after announcements of changes in dividends are released. In this efficient market, no one can earn a return above the equilibrium risk adjusted return continually according to public available information. Ryoo & Smith (2002, p.546) considered market efficiency is related to the rapid movement of stock prices to their equilibrium values after the new information is released and distortions in pricing of capital and risk will happen due to slow adjustment. Consequently the capital might be allocated irrationally within an economy.

#### **3.2.1 Previous study on a Random walk and Efficient Market Hypothesis (EMH)**

Before discussing market efficiency, we have to talk about random walk which is considered as rootstock of the concept of efficient capital markets. (Brealey & Myers, 2000, p.354). Bachelier (1900), a French mathematician, inferred the stock prices movement was unpredictable and followed a Brownian motion by empirical study.

Afterwards Kendall (1953), a British statistician, proved the behavior of stock and commodity prices appeared wandering. Instead of obtaining regular price cycles, he found the movement of stocks and commodities prices followed a random walk. That indicated the stock price changes are independent from the past prices. (Brealey & Myers, 2000, p.354). His insight about it obtained supports from Samuelson (1965) and Mandelbrot (1966). Brealey & Myers (2000, p.355) stated that the investors barely can receive any clue about probably change tomorrow according to today's price change. Namely, the prices of the stock can not be predicted and it is impossible for investors to earn excess profit for a long period. Worthington & Higgs (2004, p.2) identified *"random walks in stock returns are crucial to the formulation of rational expectations models and the testing of weak-form market efficiency"*. If the market is efficient, the stock prices involve all relevant information completely and therefore the stock returns are characterized by a random walk behavior or unpredictable. Hence, it is impossible for any trading rule strategy depended on the past series of returns to win a simple buy and hold strategy. Areal & Armada, (2002, p.93); Gilmore & McManus (2003), Worthington & Higgs (2004); Borges (2008) thought the stock market follows a random walk, indicating weak-form efficiency.

Fama (1965, p.35) in his article stated there are two divided hypotheses of the theory of random walks in stock prices. One is *"successive price changes are independent"*, another is *"the price changes conform to some probability distribution"*.

From the concept of a random walk, it seems like no insider trading that means no one can get access to the monopolistic information to profit above average. Borges (2008, p.2) argued that a random walk indicated no one can obtain the excess returns based on the historical movement of stock prices, rather than no insider trading existed in the market. At the same time, Borges (2008, p.2) identified there are the significant implications between the validity of the random walk hypothesis and financial theories and investment strategies. Therefore, academicians, investors and regulatory authorities are involved in this issue. For academicians, the hypotheses of normality or a random walk behavior of prices is the base and tool to study and understand the movement of stock prices and standard risk return models like the capital asset pricing model. When investors design their trading strategies, they need to consider the stock prices followed a random walk or persistence in the short term and mean reversion in the long term. If the regulatory authorities find it is no useful for pricing mechanism to allocate the capital efficiently in the overall economy and the market is not efficient, they will change it.

In Fama's (1965) article, efficient market firstly was introduced in the securities markets. The definition of efficient market was *"a market where there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants"*. Besides, he pointed out the efficiency indicated *"In an efficient market, on the average, competition will cause the full effects of new*

*information on intrinsic values to be reflected "instantaneously" in actual prices".*

*"And we shall contend that there is no important evidence against the hypothesis in the weak and semi-strong form tests (i.e., prices seem to efficiently adjust to obviously publicly available information), and only limited evidence against the hypothesis in the strong form tests (i.e., monopolistic access to information about prices does not seem to be a prevalent phenomenon in the investment community)." Fama (1970, p.388)*

Pettit (1972, p.993) identified the evidence of validity of efficient market hypothesis depended on more studies of different kind of information. They also chose the information about dividend payments to study the validity of the EMH based on investigating the speed and accuracy of the market reaction to this information. *"The nature of the investigation is such that it provides evidence on the hypothesis that changes in dividend levels convey important information to market participants"* Fama, Fisher, Jensen, & Roll (1969) and Brenner (1979) employed the event of stock splits to test EMH. Keown & Pinkerton (1981) examined the announcement of merger. Patell & Wolfson (1984, p.223) selected the issue of earnings and dividend announcements.

Boldt & Arbit (1984, p.26) disagreed on EMH, which suspected some parts about Fama, Fisher, Jensen & Roll (FFJR)'s EMH. For example, *"If the market were semi-strong efficient, why did it take a few months for share prices to react to information about a forthcoming split?"*; *"If the authors could detect abnormal residuals, why couldn't investors have made the same discovery after only the first month or two and reaped profits in the remainder?"*. LeRoy (1989, p.1614) was also against EMH and stated *"apparently when the evidence is favorable, market efficiency is supported, but when the evidence is unfavorable, market efficiency is treated as part of the maintained hypothesis, insulated from falsification."* Yen & Lee (2008, p.318) recognized from Fama's (1991) article even though Fama is the primary proponent of the EMH, he lowered the reliability on EMH than what he believed in 1965 and 1970. Fama (1991, p.1577) admitted indeed the stock prices can not fully reflect the private information held by the corporate insiders.

Ball (1994, p.3) wrote *"efficiency" has its limitations, both theoretically (as a way of characterizing markets) and empirically (by stretching the quality of the data, the estimation techniques used, and our knowledge of price behavior in competitive markets)*. Therefore, the authors paid more interesting and attention to *"how we can learn more about price and transactions behavior in competitive stock markets"*. After the study, Ball (1994: 33) conducted a neutral insight about EMH.

Based on Yen & Lee's (2008, p.319) study, in 1990s many arguments pointed out the EMH should be taken over by a behavioral finance approach. We will discuss about behavior finance in particularly in the following part of our thesis.

Bodie et al. (2008, p.11) declared that all available information of securities is processed quickly and efficiently in financial markets according to EMH. Besides, when the new

information about a security is published in the market, the price of security is equal to the market consistent anticipation about the security value and the security will not be overvalued or undervalued.

In order to test market efficiency, it is common to investigate whether the stock price follows a random walk or not. No matter what level of stock prices, individual stocks, group of stocks or a market index can be tested. If the market does follow a random walk, it is impossible for investor to get abnormal returns continually. *“This is consistent with stocks being appropriately priced at their equilibrium value”*. If the market rejects a random walk, the pricing of capital and risk might be distorted which is related to the allocation of capital in an economy Smith, Jefferis, & Ryoo (2002, p.475).

Previous researchers did study on both developed markets and emerging markets for testing the hypothesis of the random walk and EMH. Compared to developed markets, that emerging markets are less efficient. Hence, it's high probability to predict the stock returns in emerging countries. Besides, investors can obtain higher returns and lower risk if they add emerging market stocks in their portfolios. Harvey (1995)

Poon (1996) detected the random walk hypothesis was accepted in UK stock market even though it was rejected many times in prior studies. Smith & Ryoo (2003) studied whether five European emerging markets (Greece, Hungary, Poland, Portugal and Turkey) follow a random walk from April 1991 to August 1998 through multiple variance ratio tests. Just only the price index in Turkey followed a random walk, the rest of markets rejected it. Gilmore & McManus (2003) examined the hypothesis of the random walk and weak-form efficiency in three Central European markets (the Czech Republic, Hungary, and Poland) between July 1995 and September 2000 and obtained the different result. After univariate and multivariate tests, they found all these CE stock price behavior followed random walks, which implicated the weak-form efficiency. Furthermore, this findings on Hungary is consistent with Chun's (2000) study result that the Hungarian market is weakly efficient. The different results might be obtained by diverse methods employed by researchers. Worthington & Higgs (2004) surveyed an extensive European equity markets on a random walk and EMH using serial correlation coefficient and run tests and so on. The European countries included sixteen developed markets (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom) and four emerging markets (Czech Republic, Hungary, Poland and Russia). They detected Hungary followed a random walk and therefore is weak-form efficient. Besides, Germany, Ireland, Portugal, Sweden and the United Kingdom met the most strict random walk criteria. The results about Portugal and Czech were consistent with Areal & Armada's (2002) and Hajek's (2002) studies. The diverse chosen test methods and the significance tests performed might be result in different results, even though they study in the same market.

Borges (2008) also tested on the weak-form market efficiency by six stock market

indexes, three from France, Germany and UK which are Western European developed markets and the remainder from Greece, Portugal and Spain which belong to Southern European less developed capital markets from January 1993 to December 2007. Differed from Worthington & Higgs's (2004) classification of stock markets, Borges (2008) considered Greece and Spain were less developed markets, not developed markets. A serial correlation test, a runs test, an augmented Dickey-Fuller test and the multiple variance ratio test were adopted in order for the hypothesis that the stock market index follows a random walk. He found stock prices in France, Germany, UK and Spain followed random walks no matter what the prices are monthly or daily. However, Greece and Portugal did not accept the hypothesis until 2003.

Buguk & Brorsen (2003) tested composite, industrial and financial index in Istanbul Stock Exchange over the period 1992 through 1999 and found all these indexes followed a random walk using four methods (ADF unit root, GPH fractional integration, LOMAC variance ratio and a modified variance ratio test) and therefore the stock market was weak-form efficiency. The finding was consistent with Alparslan's (1989) study. However, the result was against Balaban's (1995) finding that Istanbul Stock Exchange was neither in the weak-form nor semi-strong form market efficiency through testing it over 1988 to 1994 since they employed different approaches to test.

Except for the studies in European countries, there are many studies in Latin American countries and Asian countries which are important emerging markets. Besides, some researchers did investigation in Africa that is a new market.

The first study of market efficiency in Korea was investigated by Cooper in 1983. Through using serial correlation test, runs test and spectral analysis, he obtained the result the Korean stock market was efficient in the weak and semi-strong levels. Ayadi & Pyun (1994, p.656) considered the traditional test methodology for a random walk such as serial correlation and runs tests caused the not proper results in developing stock markets. Indeed, different approach for tests will bring varying results. Buguk & Brorsen (2003) also thought the traditional approaches probably have such stringent assumptions that they could not catch the patterns of price movements. Pope (1989) observed that "*the traditional tests of random walks are susceptible to errors because of spurious autocorrelation induced by nonsynchronous trading which is characteristic of stock markets in developing countries*". Since Korean stock market was typical emerging market, they adopted the variance ratio test to study the stock prices movement in this market from January 1984 to December 1988. Finally, they detected the Korean stock market followed a random walk. Ryoo & Smith (2002, p.551) obtained the same result even under five regimes of daily price limits by variance ratio tests from March 1988 to December 1998.

Huang (1995) tested nine Asian stock markets (Hong Kong, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Thailand and Taiwan) including developed and emerging markets and found these markets did not followed random walks. However,



Cheung & Coutts (2001) tested Hang Seng Index on Hong Kong stock market and found the index followed a random walk thereby concluding the Hong Kong stock market was in the level of weak form. Lee et al. (2001) tested two Chinese stock exchanges (Shanghai and Shenzhen) from 1990 to 1997 and found they did not follow the random walk. Abraham, Seyyed, & Alsakran (2002) studied in Middle Eastern countries (Kuwait, Saudi Arabia, and Bahrain) and detected price changes in Saudi and Bahraini markets can not reject random walk and weak-form efficiency. However, Kuwaiti did not follow a random walk.

After studying the markets in Argentina, Brazil, Chile and Mexico, Urrutia (1995) found that these markets rejected random walks using variance ratio tests, whereas they were implicated to weak-form efficient using runs tests. Ojah, & Cole (1999) did the same study in these four stock markets and obtained the similar result that these markets followed random walks and therefore they were weak-form efficient. Moreover, the authors suggested international investors that it was impossible to earn long horizon returns based on historical information. Also, Grieb & Reyes (1999) found Brazil indexes followed a random walk. Karemera et al. (1999) examined 15 emerging markets (Argentina, Brazil, Chile, Hong Kong, Indonesia, Israel, Jordan, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand, and Turkey) and most of them followed random walk and were weak-form efficient.

Smith et al. (2002) identified the movement of stock price index of South Africa stock market is random. Both five medium-sized markets (Egypt, Kenya, Morocco, Nigeria and Zimbabwe) and two small new markets (Botswana and Mauritius) rejected random walk due to autocorrelation of returns using multiple variance ratio tests. In these countries, lack of liquidity resulted in many problems in stock markets. Appiah-Kusi & Menyah (2003) also did investigation in Africa and obtained some different results from the previous studies. Based on a robust model, Nigerian stock market was proved weak-form efficient, while the markets were efficient among Egypt, Kenya and Zimbabwe and the South African market was not weak-form efficient. The new findings from their study were Mauritius and Morocco stock markets were efficient, while the markets in Botswana, Ghana, Ivory Coast, and Swaziland are characterized by the weak-form efficiency. Due to knowing the process of pricing in African stock markets, the findings can help investors to design investment strategy and make decisions they consider the risk-return relationship in the market portfolios.

### **3.2.2 Assumptions of the EMH**

Fama (1970, p.387) stated that there are three conditions which altogether are sufficient enough to deem a market to be efficient. As following:

- There are no transaction costs in trading securities
- All market participants is free to obtain all available information in the market
- Every one involves in this market agrees on the implications of current

information for the current price and allotment of future prices of each security

Apparently, the current price of a security “fully reflect” all available information under these assumption in this market. Fama (1970, p.387) knew these assumption can not realize in practical society. However, there conditions are fortunately sufficient for market efficiency rather than necessary.

Brealey & Myers (2000, p.1007) claimed *“don’t misunderstand the efficient-market idea. It doesn’t say that there are no taxes or costs; it doesn’t say that there aren’t some clever people and some stupid ones. It merely implies that competition in capital markets is very tough—there are no money machines, and security prices reflect the true underlying values of assets”*

### **3.2.3 Forms of EMH**

Fama (1970, p.383) developed efficient market hypothesis and also defined three levels of financial market efficiency: weak form, semi-strong form and strong form market efficiency based on the degree of information reflected in security prices. All of the three forms of EMH present the essential of this theory that security prices reflect available information fully. The difference is the content and quality of information, such as the past historical information, current public news or private information. Fama (1970, p.388) presented the empirical research on the theory of efficient markets and evolution of the empirical work about EMH as follow. Initially, studies pay attention to weak form which tests just focus on past or historical prices and the most of the results were obtained in weak form tests according to the random literature. Then, researchers become interested to study semi-strong form which is associated with the speed of price adjustment to publicly available information such as stock splits announcements, dividend payment announcements, annual reports and issuing new stocks. Ultimately, strong form tests concentrate on whether any individual or institutional investors approach any recent information, which is monopolistic.

Brealey & Myers (2000, p.358) also briefly and clearly explained the three levels of market efficiency:

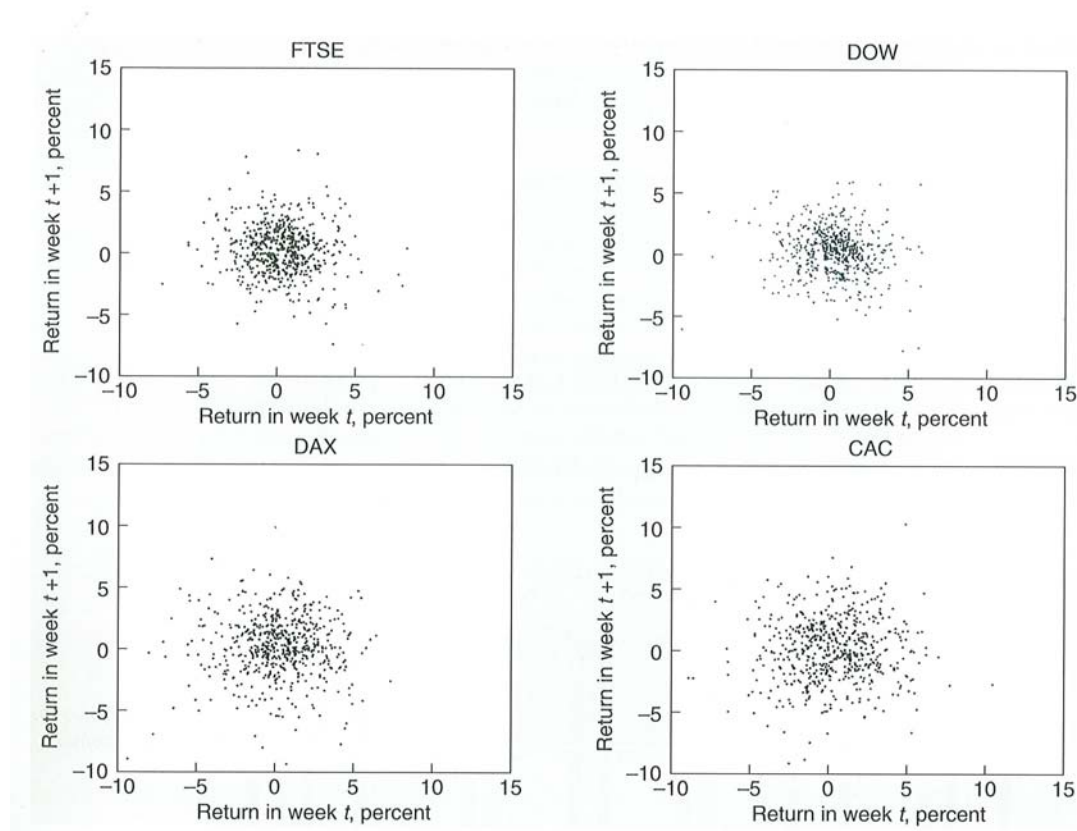
In the first level, named weak form market efficiency, *“prices reflect the information contained in the record of past prices”*. If markets are efficient in this condition, investors can not get successive splendid profits from the anaylsis of past returns. The secutires prices are charactorized by a random walk.

In the next level, known as semi-strong form, both past prices and all other published information are reflected. If markets are efficient in semi-strong sense, public information will promptly cause prices adjustment. The public information contains a new stock issuance, a merger proposal of two companies, earning announcement and so on. The last one is a strong form of efficiency. In this strong sense market, all the

information even hidden or “insider” is reflected by prices. That is, no matter the information is public and private; a security's market price will reflect it. (Keown & Pinkerton, 1981, p.856) Therefore it is impossible for any superior investment managers to outperformance in the market consistently.

### ***Weak form efficiency***

Brealey & Myers (2000, p.358) also presented the evidence supported EMH in the three level of efficient market. In the weak form efficient market, some researchers adopted the statistical method to test the returns on four stock market indexes which are FTSE 100(UK), the Dow Jones Industrial Average (USA), KAX(Germany) and CAC40(France). However, they did not find relationships between stock market returns in one week and that ones in following weeks.



**Figure 1. Scatter diagram -the correlation between the return in one week and in the following week**

In the above scatter diagram, the correlation between the return in one week and in the following week is presented by each point. The wider points scatter, less correlation between the returns.

*Source:* Brealey, Richard A & Myers, Stewart C.2000. Principles of Corporate Finance (6<sup>th</sup> ed.). McGraw-Hill. P359

An equation expresses the weak form efficiency using mathematical method. As follow:

$$P_t = P_{t-1} + \text{Expected return} + \text{Random error}_t$$

P<sub>t</sub>- price at the time t

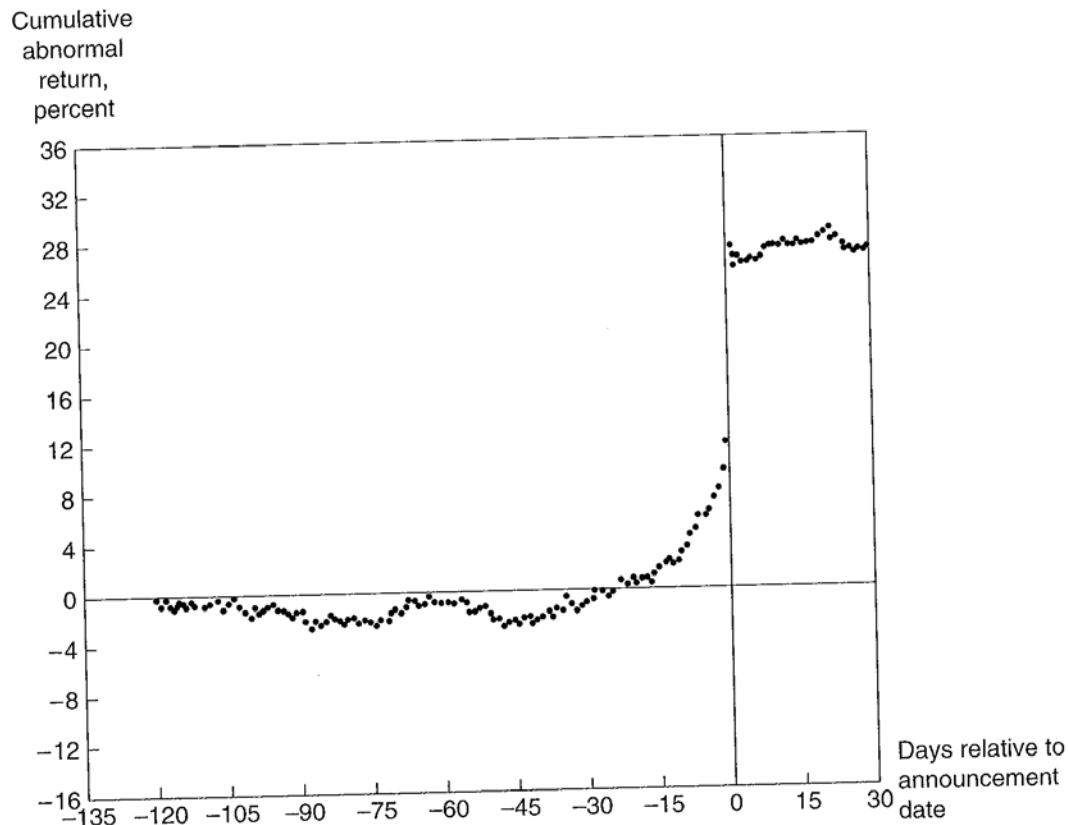
P<sub>t-1</sub> - price before the time t

Since the securities prices reflect all past available information in the weak-form efficiency, it is impossible for investors to earn significant returns by investigating the historical prices such as the technical analysis. However, the fundamental analysis is still useful in weak-form efficiency to checking price errors.

### ***Semi-strong form efficiency***

After Keown & Pinkerton (1981) investigated the announcement of merger, they (1981, p.866) found the market reacted the new public information totally by the day after the announcement thereby verifying the semi-strong form efficiency hypothesis. Moreover, Keown & Pinkerton (1981, p.855) wrote in semi-strong level the securities prices reflect all publicly available information and hence the investors who know the inside and private information can beat the market on a risk adjusted basis. They admitted the existence of trading on inside information and detected that the impending merger caused the market reaction prior to the first public announcement of the merger.

Based on the quality of the semi-strong form of the hypothesis, researchers need to test how long the stock prices react to the issuance of news like earning and dividend announcement and macroeconomic news Brealey & Myers (2000, p.359). Keown & Pinkerton (1981, p.855) tested how rapidly stock prices reflect company's takeover news and obtained on the announcement day the stock price completely reflected this takeover information.



**Figure 2. Diagram-The reaction of stock price to the takeover news**

On the announcement day, the stock price reacted to the takeover news immediately.

Source: Keown & Pinkerton, (1981). Merger Announcements and Insider Trading Activity. *Journal of Finance* 36 (September 1981):855-869.

Fama et al. (1969, p.20) studied adjustment of stock price to new information and found the stock prices reflected the stock split information at least by the end of the split month and it was more likely to happen right after the announcement date. Therefore, after their empirical study, they obtained the evidence to support that the stock market was “efficient” in the semi-strong efficiency. It was the stock prices modulated very quickly after new information was released to the market.

Brenner (1979, p.924) also adopted stock splits as a specific news sample to test the EMH empirically through five models. Three of the five market models showed the market reacted to the announcement of stock splits and therefore supported EMH. The reasons they employed stock splits to test EMH were as follows. First of all, there were many companies that published many stock splits over long period in the market. Secondly, stock splits differed from other events because it less possibility to be distorted in different company parameters. (Brenner, 1979, p.919, 927)

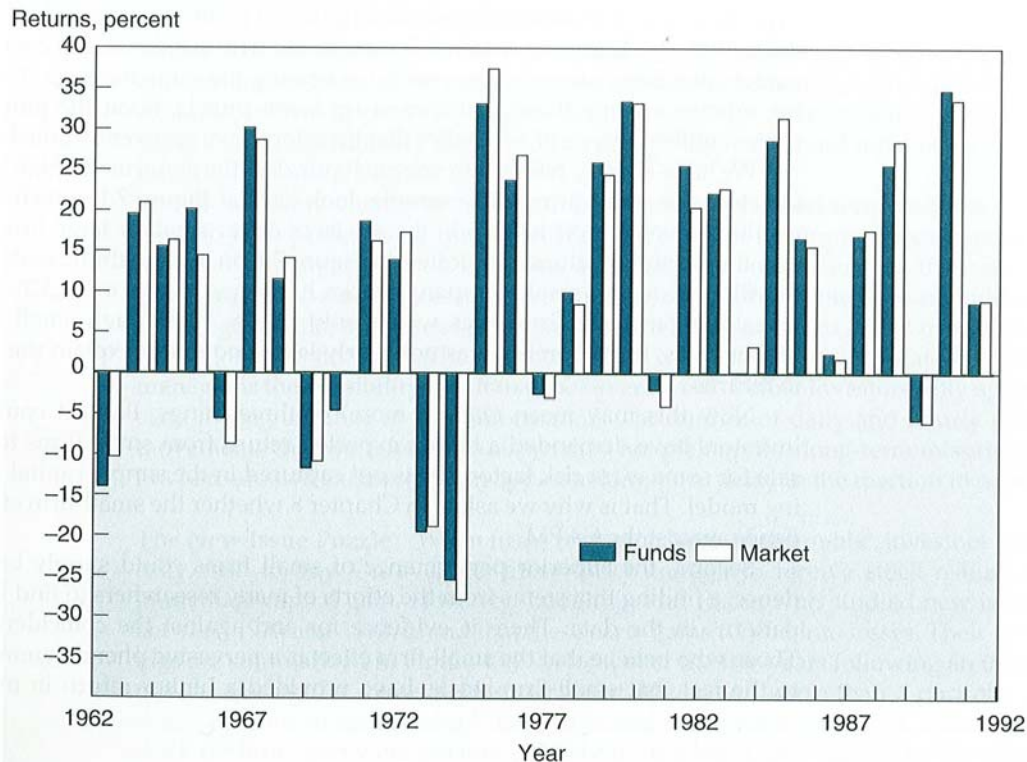
Patell & Wolfson (1984, p.223) studied how quick the intraday stock prices responded to the issue of earnings and dividend announcements through testing mean returns,

return variance, and serial correlation. They detected the earnings and dividend announcements rapidly influenced stock prices, even the main part of stock prices change happened within the first five to ten minutes after announcements released (Patell & Wolfson, 1984, p.249).

### ***Strong form efficiency***

In the level of the strong market efficiency, Niederhoffer & Osborne (1966) and Scholes (1969) detected experts and the corporate managers can benefit from the monopolistic information. They are the evidence against the hypothesis in the strong level Yen & Lee (2008, p.309). However, Chau & Vayanos (2008) were inconsistent with their insights. They (2008, p.2296) found the market which is consisted with monopolistic insiders could approach the strong-form efficiency and the prices could reflect the insider's information rapidly as the market converged to trade successively. A surprising finding was it would take a long series of observations on dividend to reflect the information in the share price without the insider. Chau & Vayanos (2008, p.2277) pointed out the insider still could get profits even though the market closed to the strong-form efficiency. That is, the market became almost strong-form efficiency did not mean the profit approached to the zero. The information acquisition could still earn considerable returns. It seems like decline of the insider's profit per share happened when the market was close to be efficient. Whereas, the insider can offset this effect through trading more when there are more often trading chances.

On the strong form of market efficiency aspect, Carhart (1997) compared the average returns on 1493 U.S. mutual funds to the market index from 1962 to 1993. From their study, they hardly found skilled or informed mutual fund managers can beat the market superiorly and consistently, which support market efficiency (Carhart, 1997, p.80).



**Figure 3. Diagram-returns comparison between the market index and the mutual funds**

*Compared to the market index, mutual funds cannot outperform in about half year between 1962 and 1992.*

*Source: Carhart, M.M. (1997). "On persistence in Mutual Fund Performance", Journal of Finance, 52, 57-82*

### 3.3 Behavioral finance

Even though EMH provide the basic rules how the stock price behave in the market, there are anomalies that do not follow these rules. Therefore, economists developed the Behavioral finance theory that explains the financial market participants' action in terms of psychological aspect. Profit warning is the news that provides the information in the market and practitioners evaluate and respond to this event. When making decisions financial market participants encounter certain heuristics. In this section we cover the development history of the behavioral finance theory, heuristics that create bias in the financial decision making, and investors' behaviors.

#### 3.3.1 Development of Behavioral Finance

About 1980s, the Capital asset pricing model and efficient market hypotheses were the main theories for explaining and predicting the behavior of the stock prices. However,

there were behaviors, which were not fully explained or understood according to the above theories, thus, there were gap of the more sophisticated theory. Therefore, the behavioral finance, new field of finance, the theory that emerged with psychology started to develop (Barberis & Thaler, 2003, p.1053). Economists began to explain the financial market participants' behaviors in relation to psychological concepts. Market participants are human being who is subject of psychology and therefore events in the financial market can be explained with help of psychological phenomena (Shefrin, 2002, xi; Barberis & Thaler, 2003, p.1054).

Behavioral finance is the psychological theories of the financial market (Penman, 2009, p.680), the application of the cognitive psychology to the market participants (Ruppert, 2004, p.43). Behavioral finance study how psychology can be used in explaining financial market events and the actions and behavior of market participants (Shefrin, 2002, p.9). Behavioral finance provides the explanations to the rational and irrational behaviors of financial market practitioners in relation to the psychological phenomena (Tvede, 2002, p.3). Behavioral finance explains driving forces that influences the stock price deviate from fundamental value (Penman, 2009, p680). Barberis & Thaler (2003, p.1054) suggested that the behavioral finance has base of the two blocks. First one is that the market participants are not fully rational, irrationality that exist has more impact on the price of stock thus limits the arbitrage opportunity. Another is cognitive psychology that explains how irrationality affects in the behavior of market participants and their decision makings.

It is possible that, the psychology can be applied into the financial market because one of their main domains of the study is a judgmental process which is same process as financial market participants make every day. (Slovic, 1972, p.782) From this point of view, the risk taking is not just the character. Previous learning experience of the similar risk taking is more important in risk taking decisions than the personality of investor (Slovic, 1972, p.795). Slovic (1972), in his study of decision making compared the group and individual's risk taking behavior and promoted that group decision is riskier than individual's decision before the group discussion. However, after the group discussion individual are more willing to take more risks (Slovic, 1972, p.796).

Tversky & Kahneman, (1974, p.1124) suggested that when people make judgment under the uncertain situation, they are biased with certain cognitive bias. That is due to heuristic used in the judgment process. Even though these heuristics are useful they create systematic and predictable errors thus people act irrationally. Heuristics used in judgment are representativeness, availability, and anchoring and adjustment. Later in 1979, they proposed framing effect importance basing on prospects theory suggesting loss is painful to people and they become risk averse in case of the loss. They prefer to take more risk in order to avoid losses. Therefore, the real risky choice can be chosen if it was expressed without mentioning the loss. The financial decision depends on how the problem is presented in terms of loss or profit. According to the Prospect Theory, people prefer avoiding losses than realizing profit even though this risk aversion brings



more risk which is idea of framing effect (Kahneman & Tversky, 1979, p.274). The risk taking attitude the decision making under the uncertain condition and judgment processes are started to be explained in connection with the psychology of the people as these are the daily situations that financial market participants encounter. Basing on these understandings, more complex anomalies of the financial markets began to be studied and explained in relation to the psychological phenomena.

Bondt & Thaler (1985), studied the mispricing of the stocks of losers and winners in the five years. Their explanation was based on the heuristics named the representativeness that was introduced by Tversky & Kahneman, (1974:1124). The idea was that the investors overreact to both bad and good news. Investors overreact to the past losers while they under react to the past winners due to the representativeness heuristics. They expect the last losers to underperform as they did in the past thus price low. While investors expect the last winners to repeat the performance of the past thus price high. In fact, the losers over perform the winners in the next three years. Investors overreacted to the losers. The poor performance of the winner is evidence of the market correction because they were overpriced (Bondt & Thaler, 1985,p 799). According to the efficient market hypothesis, such an overreaction is explained just the risk difference between the two stocks. (Ruppert, 2004, p.439)

Economists who stands for efficient market theory was defending their idea and viewed the behavioral finance as only nice stories which does not focus on main drivers of market. Instead it just distracts and diverts the attention from main points (Miller 1986:S467). Behavioral Finance is only best in explaining relevant anomalies it is impossible to be applied generally like EMH. Anomalies are depend on chances to happen and they can disappear with the change in methodology it is measured (Fama, 1998). Conrad & Kaul (1993, p.61), proposed against Bondt & Thaler (1987, p.559) that January effect is not related to prior performances thus this is not related to overreaction. Rather abnormal return of the long term contrarian strategy is related to biased performance measure and ‘January effect’.

### **3.3.2 Psychological schools**

The behavioral finance uses the different psychological schools’ ideas and concepts in explaining the behavior of the financial market participants. Therefore, we wanted to cover the psychological schools and their concepts that are relevant to behavioral finance.

The development of the psychology is considered to be started by the time of Aristotle in 350 BC with his explanations about human thoughts, feelings and brains. Then people started to be more interested in brain and its functions. More scientific developments of the subject were contributed by Wilhelm Maximilian Wundt a German scientist in 1880s. In his psychological laboratory he was studying and making experiments and afterward publishing the results. He developed the “Structuralism”

school that had principle of dividing the problem into its subparts in order to analyze and solve separately. The center of the school study was the conscious experience of individuals. “Functionalism” was the second school of thought developed by William James in 1890s. The school main focus area was irrational aspect of human nature and how thoughts lead people to be adapted into environment. It used complex perspective on the subject and used different kind of methods. (Tvede, 2002, p.57)

Another school of psychology “Behaviorist” founded by John B. Watson in 1913 has idea that man is a biological machine; our behaviors are result of learning. We should ignore the mental processes it is not solid to be studied. Burrhus Fredric Skinner (1904-1990) was one of the contributor for this school and had claimed that learning is related to the stimulus and rewarded or reinforced response. This school is valued by its contribution to the psychology as it made the purpose clearer and solid. (Tvede, 2002, p.59) The ideas of ‘magical thinking’, ‘certainty effect’ and ‘prospect theory’ are as psychological phenomena from this school that explains behavior of financial market participants (Tvede, 2002, p.77).

Next school that developed was “Psychoanalytic” school with its founder Sigmund Freud in 1900. The focus of the school was unconsciousness that influenced our actions. His object of the study was mentally ill people and their unconsciousness. Therefore the school was concentrated on reason and treatment of the psychologically troubled patients and their conditions. ‘Paranoid personality disorder’, ‘historic personality’, ‘narcissistic personality disorder’, ‘avoidant personality disorder’, ‘obsessive impulsive personality disorder’, ‘depressed personality disorder’ are phenomena that is used from psychoanalytical school in the financial market movements. (Tvede, 2002, p.65, 95)

Fifth school of thought “Gestalt” psychology founded by Max Wertheimer in 1912. Concept of the school was, we use our imaginations to perceive our surroundings however, during this process we make mistakes therefore our perceptions can be different from reality. Gestalt psychology was mainly studied memory and problem solving processes. Psychological phenomena ‘persuasion effect’ ‘self-persuasion’, ‘representativeness effect’, ‘self-realizing attitudes’, ‘knowledge attitudes’, ‘false consensus effect’, ‘ego-defensive attitude’, ‘somatic market theory’ are used in understanding behavior of participants and event in the financial market from this school. (Tvede, 2002, p.71,95)

Following school of thought called “Humanistic” psychology was founded by Abraham Maslow in 1943. They main focus of study was how people can fulfill emotional needs and reaches self actualization and based on ‘Hierarchy of Needs Theory’. The assumption of the school is we are influenced by determining forces in society and in the unconscious. However, there is potential to overcome with free will and this will help us to develop personal competence and self respect. The idea of the school was more useful in the area of understanding motivation and workplace. We are subject to adaptive attitudes and social comparison when we involve and behave in the market that

is ideas of this school of thought. (Tvede, 2002, p.72, 95)

Latest school of psychology, “Cognitive” psychology which was founded by Ulric Neisser in 1967, focuses on how human thought controls behavior. The main areas were regarding understanding information-processing, memory, perception, attention, pattern, recognition, knowledge, reasoning and problem solving. From cognitive psychology school: touchy –feely syndrome, regret theory, cognitive dissonance, anchoring and framing, mental compartments, sunk cost fallacy, disjunction, assimilation error, selective exposure, overconfident behavior, hindsight bias, confirmatory bias are relevant in understanding dynamics of market. (Tvede, 2002, p.73, 95)

### **3.3.3 Main principles of the Behavioral Finance.**

Behavioral finance tries to explain the information processing and decision making behavior of the market participants regarding the stock price and the predictions in relation to the psychological phenomena. Due to their natural mode of behavior, own strength and weaknesses the market participants make mistakes (Shefrin, 2002, p.136). These investor sentiment and limited arbitrage creates the mispricing in the market (Arnold, 2008, p.599). Irrational behavior of market participants are caused by systematic bias created when we form our belief and our preference (Barberis & Thaler, 2003, p.1063). Behavioral finance promotes that main principles that cause mispricing are heuristic driven bias and frame dependence (Tversky & Kahneman, 1974, Kahneman & Tversky, 1979). All practitioners make same mistakes repeatedly because of heuristic driven –bias. Another important area of behavioral finance is how people see the risk and return is highly influenced by how the decision problem is framed that is called framing effect (Tvede, 2002, p.127). In financial market we are framed by current price and price trend. Frame created by what we read from analysts and general media, what people say and do, what the price movements are telling us that other people are doing (Goldberg & Nitzsch, 1999, p.127). Framing effect together with heuristic driven bias causes the mispricing or inefficient pricing in the market according to the behavioral finance. In contrary to this traditional finance view that people make decisions through the transparent, objective lens of risk and return that is frame independence and when process data they use statistical tools adequately thus pricing is efficient (Shefrin, 2002, p.3).

Heuristics are rules or strategies that people use in information processing. With the help of heuristics people who have no time consider the information or had excessive information make quick decisions (Goldberg & Nitzsch, 1999, p.32). By relying on heuristics to process data we make mistakes because heuristics are imperfect (Kahneman & Tversky, 1974; Shefrin, 2002, p.4, 13). Following are the main heuristics that financial market practitioners rely on and biased by.

***Representativeness.*** When making quick judgment people use representativeness by basing on stereotypes (Goldberg & Nitzsch, 1999, p.49; Shefrin, 2002, p.14). People

believe that small part of sample represents whole sample and this leads to wrong decisions. We think the pattern will be same as small sample and apply this belief in future trend. For example current success of the firm will be interpreted as this firm will be successful in the future (Arnold, 2008, p.599). Bondt & Thaler (1985, 1987) winner and loser effect is related to representativeness. Past loser over the last three years overperform the past winners stock during the last three years. Investors thought that winners will succeed as well as did in the past, while losers will repeat the same pattern as did during last performance. In other words people are pessimistic for past losers as undervalue their stock and optimistic for past winners by overvaluing their stock. Tversky & Kahneman (1982) representativeness cause the people to underweight the base rate and to overweight the probability attached to the singular information. Representatively appears in three forms: overestimating probability, overestimate empirical and causal relationship.

- Overestimating probability: People overlook that joint event has higher representativity than individual event – conjunction fallacy. When people believe in stock price went down must go up back they became subject to gambler's fallacy. Condition and effect of conditional event can be confused and it is called conditional probability fallacy.

- Overestimating empirical relationships: We think there is empirical relationship by thinking in schemata even this does not exist. This is called illusionary correlation and leads us to wrong judgment about the fact.

- Overestimating causal relationship: Future estimation is based on past observation and people believe that past history will be continued in the future. Causal relationship is overestimated or believed to exist even there is not (Goldberg & Nitzsch, 1999, p.49-56).

In the financial market, when investors thinks that current trend will continue as it was in the past and make their estimation and decisions. (Tvede, 2002, p.153)

***Anchoring and Adjustment.*** When people make estimation or assessment of information they base on first source or reference value that is anchor. Then after arrive to real value with the help of detailed analysis that is adjustment (Goldberg & Nitzsch, 1999, p.45). People look for clue as anchor to make decisions (Tversky & Kahneman, 1974). Anchors in the financial market can be stock price, opinion and attitude of others, analyst advices, forecast and data available in the market (Goldberg & Nitzsch, 1999, p.48).

***Availability.*** When people make judgment they have different level of information availability. They tend to base on easily available information and make wrong judgment (Goldberg & Nitzsch, 1999, p.37). Instead of seeing the big picture people focus on easily available or visible, recent or surprising information (Arnold, 2008,

p.599).

**Ambiguity aversion.** People prefer familiarity in comparison to unfamiliarity (Shefrin, 2002, p.21) because they are afraid of they do not control the situation (Arnold, 2008, p.600). This phenomenon explains why investors prefer to invest in local market than international market neglecting international diversification benefit (Arnold, 2008, p.600)

**Overconfidence.** People overestimate their abilities. In the financial market, people overestimate their forecasting and trading skills (Arnold, 2008, p.599). Excessive trading in the financial market is explained by overconfidence of investor (Barber & Odean, 2001; Arnold, 2008). Especially male traders active trading is empirically proved that they are more overconfident than female traders (Barber & Odean, 2001, p.289). Investors who have no prior experiences tend to be more overconfident than experienced investors (Arnold, 2008, p.599). As becoming overconfident we set narrow confidence bands in estimating by setting high guess too low and low guess to high. As a result become surprised more frequently (Shefrin, 2002, p.18). Oskamp (1982, p.293) studied the overconfidence in case study judgment and concluded that the confidence increases as people get more information and experience however the accuracy of decision making does not increase as well.

**Conservatism.** People are conservative and slow in changing thoughts and beliefs when new things happen (Edwards, 1982). Thus investors under react to news and creating momentum in the market as stock price reflect the news slowly. (Bodie et al., 2008) If firm had subsequent number of higher profit than expected, it creates sequential earnings surprises because investors are slow in revising their estimation regarding such news. (Arnold, 2008, p.600)

**Mental accounting.** People tend to see things in separate mental account and ignore the relationships between them. (Tversky & Kahneman, 1982) In the financial market by ignoring the interrelations of two different accounts can lead us to improper risk assessment thus missing the investment opportunity. (Goldberg & Nitzsch, 1999, p.37) People have needs to control the situation and make logical and right decisions. These needs drive to the irrationalities in the financial market.

**Cognitive dissonance:** When people make choice from alternatives and if information available support his or her chosen alternative it is consonant, if contradict it is dissonant. Then in case of dissonance people try to confirm that their decision was right thus make mistakes. Selective observation: Due to need to confirm their decision they collect information that only supports their decision. Selective perception: People misinterpret information so that confirm their own behavior and attitudes. Due to need to control the situation people overestimate capabilities to estimate price developments in the market then taking risky actions and end up with huge losses. If the need to control does not meet, people have fear, panic thus cannot act rationally. (Goldberg &

Nitzsch, 1999, p.42, 95) Moreover it is explained with phenomena confirmatory bias. Our conclusion is biased what we want it to be. Therefore, in the financial market it create anomaly of prolonging trends as people avoid information that will prove that they made wrong decision (Tvede, 2002, p.190)

**Attitudes.** Our hidden needs and wishes lead us sometimes to wrong conclusion thus wrong decision. Adaptive attitude as we follow others attitude without logical reasoning. Self-realizing attitude is we do something in order to realize ourselves at certain image. Knowledge attitude as we handle information and form attitude. Ego defensive attitude expressed when we protect our decisions that were wrong looking for harmony. (Tvede, 2002 ,p.133)

### **3.3.4 Investors and their behavior**

#### ***Rationality and Risk Aversion.***

EMH argue that investors are rational thus always arrive to true value of the stock while behavioral finance argues that investors act everything but rational (Goldberg & Nitzsch, 1999, p.9). As human being, people has the need to make logical, reasonable correct decision they try to be rational. However, due to their natural mood and psychological needs they make mistakes thus act irrational. The need to avoid from dissonance results in loss and regret aversion, while unmet need of control leads to risk aversion (Goldberg & Nitzsch, 2001, p.117).

Under the utility function theory, money is not the important thing rather the satisfaction or utility arriving from the money is more important. When consumption increase utility arriving from this decreases and when such trend is noticed in the investors action it is called investor is risk averse (Arnold, 2008, p.191). Risk aversion is related to control deficit phenomena. As people need to control the situation if such need does not meet they become risk averse. Risk aversion increases if the money value concerning is large, and especially if it is loss. Moreover, it increases when people have not so much competence regarding the decision or it is difficult to estimate the probability of event. Another important factor is whether investor values the result of decision in the separate mental accounting. Investors who closely look for the price movement is more risk averse than those who review in the long term. (Goldberg & Nitzsch, 1999, p.195, 121)

Kahneman & Tversky (1979) in their prospect theory propose that when investors make risky choice their value function depend on gain and loss of the decision to be made. The attitude to such selection is drawn as concave for gains and convex for losses and steeper for losses than gain. People perceive the losses with more pain than joy from gain and this trend is named as loss aversion (Kahneman & Tversky, 1979, p.279, 288; Tversky & Kahneman 1986, p.258). Why trading volume is higher in bull market than in bear market is explained through prospect theory. Due to our ego defensive attitude- we do not like to admit our errors to ourselves or to others. When investors decision

turned out to be wrong and confront the loss, people are reluctant to face it thus losses run further. That is explained by regret theory and loss aversion. (Tvede, 2002, p.193)

People look for maximization of expected value of utility in each decision. As amount of money involved increase the utility value decreases. In case of small amount of money involved and increase of capital and consequent utility arriving it is higher than if the case is involved large amount of money. So if investor has small amount of money and had success in trading and earned certain amount of profit he or she will receive more satisfaction than if he or she had traded with large amount of money and gained same amount of profit. Thus attitude toward risk depends on the amount of wealth involved. Moreover, the commitment made to decision also influence the loss aversion as more committed the investor was more pain will bring the mistake (Goldberg & Nitzsch, 2001, p.106).

When investor attempt to behave rational it is important to weigh up the outcome of the decision (Goldberg & Nitzsch, 1999, p.122). Moreover, they are required to be interested in any information and carefully and logically evaluate this information in order to behave rationally. Furthermore, they should be avoid making judgment with involvement of emotion like joy, greed, fear, panic, a desire to control or self affirmation. (Goldberg & Nitzsch, 1999 p.29)

Goldberg & Nitzsch (1999, p.131) developed five aspects of rationality after considering the irrational behavior patterns of investors. This classification is not strict but investors can have all of these symptoms at the same time or some of them as dominating. However, it gives clear picture of what we can be aware of our weakness thus help us make rational decisions.

1. Use of heuristics-premature acting. This type of irrational participants depend on heuristics as they do not dedicate time to analysis of information, if refer to information it will be very limited and only easily available information will be used to make decisions. They think in certain pattern and such habit and hurry leads to wrong judgment. In addition they like to expose in large extent. (Goldberg & Nitzsch, 1999, p.132)
2. Relative evaluation- identifies too much with the purchase price. Such irrational participants focus on purchase price and try to make profit in every transaction. In case of unsuccessful exposure they love to take risk as keeping the position, however in case of successful exposure tend risk-averse by taking profits early. (Goldberg & Nitzsch, 1999, p.132)
3. Striving to be free of dissonance-committed to decisions. They are reluctant to admit mistakes and hopes for chances to turn the loss into profit thus overestimate the opportunity. They hate to admit the mistake not only himself but also others thus look for every opportunity to protect himself and confirm

own decision. Thus become subject to selective observation. (Goldberg & Nitzsch, 1999, p.132)

4. Control illusion- overestimating control opportunities. Thus kind of people overestimate capability their ability to act successfully in financial market, believe that they can control the situation thus like to take risks. The consequence of such overestimation leads to holding on decision too long, being non sensitive to market. They aim to be seen as good for others and to become rich quickly by investing huge fortune in few stocks.
5. Loss of control phenomena- fear of non controllable exposures. They have strong need to control the situation and to be well informed. If this need does not meet they become stressed and anxious and act impulsively. Thus they prefer to avoid uncontrollable situation and sometimes miss lucrative investment opportunity if they think they cannot control. (Goldberg & Nitzsch, 1999, p.133)

Furthermore, they related it to the brain structure of the people and classified them into three categories and defined susceptibility file pertaining irrationality of these people.

The behavioral finance explains the behavior of the investors and other participants from the psychological point of view. The profit warning is the information that result in the surprise thus financial market participants react to the news with overreaction and under reaction. This phenomena are related to the human heuristics caused bias and the way the profit warning the framing of the information.

### **3.4 Capital Assets Price Model (CAPM)**

Brealey & Myers (2000, p.199) claimed that in the creation of our economic models, simplifying is needed in order to interpret the reality and our world around us. In our research, we adopt CAPM to estimate the normal return. The capital asset pricing model provides a theoretical basis for the positive relation between risk and return. (Lee, Chen, & Rui, 2001; Bodie et al., 2009, p. 279) wrote CAPM is a centerpiece of modern financial economics, which provides an accurate forecast about the relationship between the risk and its required return. Two important functions are brought by this relationship. *“First, it provides a benchmark rate of return for evaluating possible investments. Second, the model helps us to make an educated guess as to the expected return on assets that have not yet been traded in the marketplace”.*

Keown, Martin, & Petty (2010, p.176-178) wrote *“the capital asset pricing model is an equation that equates the expected rate of return on a stock to the risk-free rate plus a risk premium for the stock’s systematic risk”* and *“the security market line is the graphic representation of the CAPM. It is the line that shows the appropriate required rate of return given a stock’s systematic risk”*. The relation between risk and return shows in the capital asset pricing model (CAPM). The equation of CAPM and security market



line are as follow

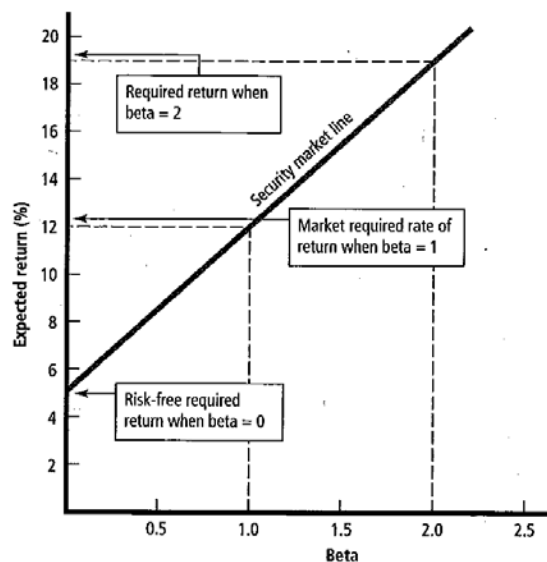
$$\text{Required return on security, } r = \text{risk free rate of return, } r_f + \text{beta for security, } \beta \times \left( \text{required return on the market portfolio, } r_m - \text{risk-free rate of return, } r_f \right)$$

- $r$ - is the expected return of asset  $i$
- $r_f$  - the risk-free rate of interest such as interest arising from government bonds
- $\beta$ -is the sensitivity of the expected excess asset returns to the expected excess market return
- $r_m$ - is the expected return of the market
- $r_f$  - is the market premium or risk premium (the difference between the expected market rate of return and the risk-free rate of return).

*Quoted in : Arthur J. Keown, John D. Martin & J. William Petty, 2010. Foundations of Finance. Pearson Educaion (seventh Edition)*

The relationship between risk and return in the market is showed in this equation and beta represents the risk.

We will explain these variables in this equation carefully in the following practical methodology chapter.



**Figure 4. The Security Market Line**

*Quoted in: Arthur J. Keown, John D. Martin & J. William Petty, 2010. Foundations of*

The Security Market Line illustrates the different required rates of return according to different betas. If the beta are 0, 1 and 2, the required rates of return are 5%, 12% and 19% respectively by the calculation of the equation of CAPM.

There are two advantages of employing CAPM to price the security. One is this model is easy to be understood. Another is dividend or the growth rate in dividend will not be used in this model. Keown et al. (2010, p.242)

### **3.5 Agency theory (Corporate governance and profit warning)**

Along with the growth of the corporate, the separation of ownership and control becomes a demand. The agency has more professional knowledge and skills to manage the corporation than the principal. However, at the same time, the features of the separation not only create the agency problem but also raise information asymmetry problem. Managers are more aware of daily operation performance and condition of firm. This information position and natural conflict of interest to prefer own interest will give managers the opportunity to take information advantage over the shareholders and market overall. (Eilifsen et al., 2009, p.7; Odgen, Jen, & O'Connor, 2003, p.104) In addition to separation of ownership and control form, another reason that creates the information asymmetry is competition in the business world. Due to market competition, firms are unable to reveal strategic information to its shareholders even though they should. Shareholders can be also their competitors. Therefore, agency problem, separation of ownership and market competition create asymmetry of value relevant information between firm and other financial market participants. (Odgen et al., 2003, p.104) The consequences of these problems related to information asymmetry can, even, destroy the value of firm. Managers who took the advantage of information asymmetry will boost the unreasonable overvaluation with the illusion of growth by aggressive accounting methods with manipulation purpose. This will not create any value to shareholders, even to fraud and litigation later. As a consequence they will lose the trust of shareholders and can even go bankruptcy (Francoeur et al., 2008, p.317). If investors have inadequate or insufficient information there will be difficulty and uncertainty in the market, moreover failure of security can happen (Odgen et al., 2003, p.133).

The solution of problems related to information asymmetry in practice is to have good quality corporate governance system that makes the firm provide reliable value relevant information to public and ethics (Jensen, 2005; Karamanou & Vafeas, 2005; Bodie et al., 2009). Firms accept to incur the cost of control and monitoring to establish adequate corporate governance system, in order to reduce information asymmetry (Fama & Jensen, 1983). At same time, it will make the market more transparent in favor of allocating capital efficiently.

Many stakeholders constitute a modern corporation, which include managers, employees, shareholders, and bondholders. Different groups have different interests and aims. Interest conflicts happen among these groups. (Brealey & Myers, 2000, p.1009) The most common interest conflict in a corporation occurs between the management and ownership. Brealey & Myers (2000, p.8) pointed out it is necessary for big companies to separate the ownership and management practically. The advantages of the separation are changing shareholders without intervening company's operation as well as expert and professional managers can be hired. However, at the same time, the problem occurs since managers and owners have different interests and objectives. The interest of the shareholders is maximizing the value of the firm. Whereas the managers intend to have more salary or bonus and less working hours or luxurious working environment which exploit shareholders' interest. Principal-agent problems are generated by this conflict between managers (agent) and shareholders (principal). Therefore, shareholders have to spend some costs in monitoring management and affecting their behaviours so that managers can do their best to increase firm value, which results in agency costs. Brealey & Myers (2000, p.9) believed it is easier to solving principal-agent problems if managers, shareholders and debt holders had same information. But it is hard to achieve in finance. Hence, it is essential for financial managers to identify these information asymmetries and manage it carefully to preserve investors' confidence towards surprises information.

In Helbok & Walker (2003) article, they offer the way to optimise the agency cost. *“In practice agency costs are optimised through a variety of costly control mechanisms i.e. monitoring by shareholders, monitoring through the board of directors, monitoring via the market for corporate control (merger, takeover, etc.), and costly incentive mechanisms such as executive stock options.”*

Executive officers and directors have good knowledge about the value of their companies. When the company applies governance mechanisms like options plans and multiple votes per share, the interest of the managers and directors is aligned tightly with the market value of the company. If the market overvalues the company, there is less motivation for executives to alert the market thereby releasing a profit warning. The authors pointed out there are negative relationship between governance mechanisms and profit warning decision. (Francoeur et al., 2008, p.317, 330)

Helbok & Walker (2003) did research how the ownership and the third party affect the willingness to warn. The authors (2003, p.29-37) categorized ownership into three types: inside/managerial, institutional shareholdings and dispersed ownership. Both institutional shareholdings and dispersed ownership are regarded as outside ownership. The institutional shareholders mainly include pension funds, insurance funds and unit trusts. Some findings are obtained from their research.

The first finding is more the managers have the company's shares, the less willingness to issue bad earnings surprise to the public. The management might prefer to care about

the existing shareholders included themselves instead of the potential shareholders. Francoeur et al. (2008) also found the similar result about the relevance between the issue of profit warning and managerial shareholdings.

The next finding is the higher proportion of institutional shareholders is, the more probability of disclosure is. The institutional shareholders think it is possible to discuss the bad news with the company and other investors after the company issues the bad news in public thereby interfering the management's reaction to the bad news. However, institutional shareholders tend to postpone the public warnings if they could earn profit from the private news priory.

Francoeur et al. (2008, p.318) also obtained the result from their empirical study *“independence of the board of directors and the financial expertise of members of the audit committee have a significant positive effect on the provability of management's revising their predictions”*. Namely, the more independence of the board of directors (BoD) and the financial expertise from auditing, the more possibility for management to modify their earnings forecast. Besides, they found managers do not always decide the disclosure when the company is overvalued. For example, managers prefer to disclose the profit warning to remove away the overvaluation for the company if they think analysts realize the overvaluation and will change the earnings forecast later. However, the managers probably keep silent if just only the market overvalues the company.

### 3.6 Previous Empirical Evidence

#### 3.6.1 Negative stock returns following the profit warning in announcement window

**Table 3. Some previous researches about the stock returns in different announcement window**

<b>Announcement window</b>	<b>Researches</b>
11 days (5 days before and after)	Jackson & Madura (2003) Bulkley & Herrerias (2004)
2 days after	Jackson & Madura (2003) Bulkley & Herrerias (2004) Elayan & Pukthuanthong (2009)

It is important to choose the appropriate period as the announcement window to observe the stock prices and investigate abnormal returns. We have to keep in mind that it is

probable to derive different consequences on abnormal returns following diverse selected window. Bulkley & Herrerias (2004, p.11) firstly chose eleven days as the window which is from five days before the warning to five days after it. In this announcement window, the stock price cumulatively decreased by about 22%, which can show the importance of profit warnings. Afterwards, they collected and calculated abnormal returns for each warning stock and the averages of these daily returns among all warning stocks. Abnormal returns following qualitative warnings are -24.7%, which are more negative than for quantitative warnings, -20.7%. They (2004, p.11-12) deduced generally qualitative warnings are regarded as worse news than quantitative warnings due to the scarcity of disclosure. Jackson & Madura (2003, p.512) also investigated over the eleven-day period, before and after the warnings and found the accumulated response was -21.7%. These two group researchers both examined the same time period from 1998 to 2000 in US and got similar result about share price responses to the profit warnings. The results were similar rather than the same because the samples they selected do not exactly same. One of them chose earnings warnings by US companies as the sample from CNN site, another collected profit warnings by any companies in the Wall Street Journal.

In the following, Bulkley & Herrerias (2004, p.12) examined the abnormal returns for stocks bought two days after a profit warning and held for the succeeding six months following qualitative and quantitative profit warnings respectively. In the beginning of this test, they preferred to choose the next twelve months after releasing profit warnings as the observation period. After tracing the abnormal returns over one year, they did not find significant abnormal returns between the sixth and twelfth months. Therefore, they arrowed down the first six months to do research using the measurement methods of CARs and BHARs. No matter which methods they adopt, they found more negative abnormal returns following qualitative profit warnings than following quantitative ones. The result supports their opinion about the qualitative warnings are regarded as worse news than quantitative warnings.

Tucker (2006) did research on both warning and non-warning firms and raised the opinion against previous researchers' findings which the openness seems like punishment for warning firms by investors. Indeed, the author found the warning firms had lower returns than non-warning firms in short term window, five days after earnings warnings. However, returns were similar between warning and non-warning firm in long term like three months. Jennifer considered the reason was self-selection bias and identified around earnings warnings. Warning firms issued more non-earnings news than warning firms. This situation was always ignored in prior researches. Investors might not fully react on other bad news, which might affect the returns around earnings warnings.

Elayan & Pukthuanthong (2009, p.165, 173) did research on US market from 1997 to 2002 and also found the market had negative respond for the profit warning, -16.59% cumulative average abnormal return over the two-day announcement period. The reason

was these warning announcements would probably be explained as bad news by the market participants. That resulted in significantly negative reaction from the market.

Jackson & Madura (2003, p.509) tested the mean two-day cumulative abnormal return (CAR) following profit warnings and obtained the -14.72% of CAR which was 32 times of CAR following the succeeding earnings announcement. It proves the profit warning can reduce the blow of earnings surprises to the market before the earnings announcements are released. Moreover, they (2003, p.509) found the profit warnings were under reacted by the market at the announcement day since substantially negative CARs occurred till a four-day period after the announcement day. However, their other finding is different from other researchers' worry about the market overreaction. Even though the drastic market reaction happened at the warning announcement, there is no indication of a reversal in the following trading days and no evidence shows that market response to profit warnings is excessive. Therefore, they (2003) did not believe the market would overreact the profit warning.

### **3.6.2 Other effect factors (firm-specific factors).**

Kasznik & Lev (1995, p.133) found in general firms issued the profit warnings would obtain more negative stock returns than non-warning firms. There are some different existing factors to impact the stock price following the profit warnings, for example, the firm's size and the character and nature of the companies. They (1995, p.133) claimed the feasibility that companies issue profit warnings is definitely related with the firm size and the industries in which the companies are. For instance, the companies in high tech industry have more motivation to issue profit warnings because they want to avert investors' suspicion and litigation. They found large companies probably warn investor to the bad news because they are more exposed to litigation than small companies. Francoeur et al. (2008, p.330) did research on Canadian firms from 2000 to 2004 and also found averagely profit warnings from high-tech or large firms are more than that ones from traditional industries or small firms. Bulkley & Herrerias (2004, p.15) discovered initially small firms got larger effect following profit warnings than large firms and also obtained a much greater effect than large firms when they release qualitative warnings rather than quantitative ones in the announcement window. Compared to the growth stocks, the value stocks receive gentle hit by profit warnings, especially by qualitative warnings. Jackson & Madura (2003, p.503) divided the sample including 245 profit warnings into small firms and large firms based on their total assets. If firms are smaller than the industry median of the sample, they categorized the firms as the small firms. The firms will be regarded as the larger firms if they are larger than the industry median of the sample. Jackson & Madura (2003, p.512) also found smaller companies are hit more by negative effects during the information announcement and the post-warning period. Collett (2004, p.4) surveyed the listed companies in London Stock Exchange and found the market reaction for small company announcements was greater than for large companies. Elayan & Pukthuanthong (2009, p.165) detected there are many factors impacted the extent of market reaction following the profit warning,

such as the difference between the analyst previous expectation and the company revised earnings forecast and firm size. The companies in high-tech industry and with high percentage of intangible assets will probably be influenced from the profit warning more negatively. (Elayan & Pukthuanthong, 2009, p.174) Moreover, they claimed (2009, p.165) the higher information asymmetry companies have, the larger price decline they will suffer after warning announcement.

### 3.6.3 Summary of theoretical chapter

If the market is efficient, all available information in the market reflects in the securities prices and the prices change rapidly to the new information in the market. The prices follow the random walk; therefore, it is no possible for any investors to predict the future stock prices according to the past historical price record. The technical analysis does not work in this condition. The profit warning is information. Consequently, if the market is efficient, the disclosure of profit warning will cause the movement of securities prices immediately and finally the information of the profit warning will reflect in the securities prices. Recent years, a new subject in finance is introduced, named as behavior finance. The behavior finance explains some phenomenon about the investor's reaction for the profit warning, which is associated with psychology. Based on the previous studies, disclosure of profit warning will result in the stock price movements thereby changing the company's value. However, some companies still issue profit warnings in order to avoid shareholders lawsuit cost and reputation crisis. They hope the profit warnings will reduce the earnings surprise for investors prior to the real earnings announcements. And at the same time, they can choose different types of profit warnings, such as quantitative and qualitative, to mitigate the negative reaction of the market. Besides, the companies prefer to release the permanent disappointment earnings instead of short-term bad earnings consequence. Whereas, some companies are not willing to publish the profit warning because they worry the market will overreact it. It might cause the extremely negative abnormal returns. However, according to Elayan & Pukthuanthong's (2009, p.2) study, the performance of firms' openness will get reward. From six months to two years after warning, the warning companies' performance better in the stock market than the unwarning companies. They detected the companies gain benefits from transparency in the long-term.

Based on our research of the literature review and previous empirical researches we develop following hypothesis in relation to our research sub questions, we develop our first hypothesis as following.

***Hypothesis 1:*** Mean Abnormal Return or Mean Cumulative Abnormal Returns are equal to zero.

H0:  $AR=0$  or  $CAR=0$

H1:  $AR \neq 0$  or  $CAR \neq 0$

Our null hypothesis denotes that mean ARs or mean CARs are equal to zero thus

meaning profit warning does not impact the stock return thus stock price. Alternative hypothesis denotes that mean ARs and CARs are not equal to zero thus meaning profit warning impact the stock return and stock price.

**Hypothesis 2:** Mean Abnormal Return or of the quantitative and qualitative profit warnings are equal.

H0: AR quantitative = AR qualitative;

H1: AR quantitative  $\neq$  AR qualitative;

The null hypothesis denotes those means ARs for the quantitative and qualitative profit warnings are equal thus there is no difference in the impact of profit warning according to profit warning type. Alternative hypothesis denotes that mean ARs for the both types of profit warning is not equal thus meaning there is difference in the impact of the profit warning according to type.

**Hypothesis 3:** Mean Abnormal Return for the small, medium, and large firms are equal.

H0: AR small = AR medium; AR small = AR large ; AR medium = AR large

H1: AR small  $\neq$  AR medium; AR small  $\neq$  AR large; AR medium  $\neq$  AR large

The null hypothesis denotes those mean ARs for the small, medium, and large firms are equal thus there is no difference in the impact of profit warning according to the firm size. Alternative hypothesis denotes that mean ARs for the different sizes of firms are not equal thus meaning there is difference in the impact of the profit warning according to the firm size.



## 4. Practical Methodology

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*In this chapter, we present the practical method we employed to do empirical study. We claimed where and how we get our data and explain our research method specifically. According to the research method, the readers will clearly know our analysis procedures step by step. Moreover, validity and reliability as the criteria of research are presented in the end of this chapter.*

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### 4.1 Data collection

According to Saunders et al. (2009, p.258), documentary, survey-based and multiple-source secondary data are three primary subgroups of secondary data. Documentary secondary data includes written materials, such as notices, minutes of meetings, reports to shareholders and administrative records, and non-written materials, such as voice and video recordings, pictures and so on. Survey-based data adopts a survey strategy to collect data. The multiple-source data can be based on documentary, survey-based data or compilation of the two. (Saunders et al, 2009, p.258-262)

There are many advantages of using secondary data, such as resource efficiency, capacity for evaluation, potential for comparative analysis and potential for new insights Hair et al. (2007, p.128). On the other hand, Hair et al (2007, p.128) claimed some disadvantages like misalignment of purpose and age of data. There are also limitations of secondary analysis like unfamiliarity with data, no control over data quality and lack of key variables. Therefore, in our study, we will keep in our mind these weaknesses and limitations of using secondary data, and try to avoid their influence on our research. The most important advantage of adopting secondary data in our study is that we can save time, expense and effort to do research.

In our thesis, firstly the profit warnings are commercial sources as the documentary secondary data which we collect from the electronic journal. Secondly, the stock prices and the total assets of companies we gathered from the Thomson Reuters DataStream database or the companies' annual reports are the documentary secondary data. Therefore, we adopt documentary secondary data in our research. On the other hand, the primary data is normally collected by interviews, surveys and questionnaires. These methods are not suitable for collecting the profit warnings, corresponding stock prices and total assets. Therefore it will lead to collect appropriate and complete data.

Since we want to test how the profit warnings effect the stock prices, we need to collect the profit warnings firstly. There is no available database that includes the profit warnings in the EU area, and nor the relevant stock prices information solely. Therefore, we had to build our own database and collect the data from different sources mainly online. According to Kasznik & Lev (1995, p.114), warning announcements are

delivered to the public through alternative channels; such as a public announcement via the news wires or a conference call with analysts. The news wires consist of many channels like the Internet, the newspapers and the TV programs. We select the profit warnings via the Internet because it is convenient, fast, economic and publicly available. Jackson & Madura (2003, p.503) collected profit warnings from the Wall Street Journal in order to confirm the market is well conscious of the news. Therefore, in our research, the website we chose to collect the profit warnings should be popular and have high prestige among investors in order to ensure the investors are familiar with the announcement information. The website of the Financial Times ([www.ft.com](http://www.ft.com)) is used to collect the profit warnings issued by quoted companies within the EU area. This website provides analysis and comments about financial markets and institutions, financial news and information from the listed companies comprehensively. We searched the Financial Times search engine, using the keywords, such as “profit warning”, “warning announcement” and “Europe”.

#### **4.1.1 Population and sample selection**

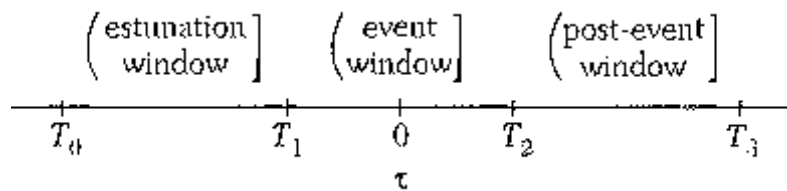
Using above mentioned method, 358 profit warnings related announcements were found as our research population that is European firms that issued profit warnings during the last two and half year period. These were 208 firms in 2008, 110 firms in 2009, 40 firms by April 2010. Out of this population, firms not listed or traded in the Euronext Stock exchange were excluded. The final sample consists of 87 European companies that issued profit warnings during the last 28 months. We chose the firms that are listed or traded in the European market as our target research area was EU. In the next step, Thomson Reuters DataStream database at the Umeå University Library is used for obtaining daily adjusted closing equity price and total assets of the firms. Moreover, corresponding date Euronext 100 index time series data was also obtained from Thomson Reuters DataStream database. However, some companies' variables are missing in this database. We collected that information from the companies' annual reports that were downloaded from the companies' official websites. The sample period we choose is between January 2008 and April 2010. The first reason we choose this timeframe is this period is the post-financial crisis and the economic condition is not good. The stock market is the bearish market. The investors are more careful of their investment decisions and beware of the risk in the stock market. Therefore, they might have more sensitive about the bad news and probably have different reactions compared in the bullish market. The second reason is that we want to examine the relationship between profit warnings and stock price and the reaction of investors on profit warnings in recent years thereby arriving with updated information, since many previous researchers did the similar studies in this area in 90s and in the early 2000s.

## 4.2 Practical Research Method

We choose the information content event study, as our purpose is to study whether profit warnings provide the information to the market, thus impact the firms' security value. As the profit warning is a relatively new event in the corporate world, it is recommended to use the information content event study. Information content analysis is one of the types of event study that focus on clarifying the understanding of the role of information. (Bowman, 1983, p.565.). We will present the steps of the event study method in steps in this chapter and present the results in chapter 4.

### *Event Study step 1: Event definition*

The first step of the event study is defining the event of interest and the event window. Our event of interest is the profit warning announcement, which contains the information that earnings of the issuing firm will not meet the market expectations. As we are interested in an event that occurred at different calendar times for different firms, the event time concept is used. The calendar date of the profit warning announcement becomes time zero in event time. All remaining time periods are presented in event time in relation to this time zero (Bowman, 1983, p.563). Important to consider here is how precisely the event date can be identified. Moreover, there is the risk that misidentification of the event date results in missing the observation of the impact of the event (Bowman, 1983, p.563). When we read the profit warning announcement we check if the announcement specifies the exact day of the profit warning, and if no exact date is mentioned we define the date of the published announcement as the event date. Thus we are confident that we could determine the exact date of the event. In addition, in order to avoid the influence of compounding events (Bowman, 1983, p.565) on the value of the security we determine a relatively narrow event window. In case of a broad window there is the risk of having noise on the result from other events. By having a narrow event window, we are able to capture the price change solely due to the profit warning (Lev 1989, p159). In order to clarify the event time concept, the following time line is presented.



**Figure 5. Timeline for the event study**

*Source: MacKinlay, A.C. (1997). Event Studies in Economics and Finance. Journal of Economic Literature, 35(1), 20.*

Our  $T_0$  to  $T_1$  estimation window is 135 days before the profit warning announcement; from  $T_1$  to  $T_2$  is the event window consisting of pre-event 5 days, actual day of

announcement 0, and 5 days after the announcement.  $T_2$  to  $T_3$  is the post event window, consisting of the next 60 days from the actual day of announcement.

### ***Event Study step 2: Selection criteria***

In the event study method, once the event to be studied is chosen and the event windows are defined, sample selection should be made using the research criteria. Such restrictions in our research would be European firms that are listed or traded in the Euronext Stock Exchange, and that issued profit warning during the period from January 2008 to April 2010.

### ***Event Study step 3: Normal and Abnormal Returns***

Next step of the event study will be calculating normal and abnormal return. Normal Return is the return that would be expected if the event did not occur. There are statistical and economical models used in estimating the normal returns. Statistical models focus on statistical assumptions while economic models focuses on investors' behavior while adding statistical assumptions. Therefore it is preferred to use an economic model as it calculates more precise measures using economic restrictions (Campbell, Lo, & MacKinlay, 1997, p.153-154). We will use the economic model called Capital Asset Pricing Model (CAPM) to estimate the normal return. In the CAPM, the systematic risk parameter (beta) is equal to the slope coefficient in a time series regression of individual firm return on a market index. (Bowman, 1983, p.568 )

For any security  $i$  we have:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f) \quad (1)$$

$$\beta_i = \frac{\text{Cov}(R_i, R_m)}{\text{Var}(R_m)} \quad (2)$$

Quoted in : Campbell et al1997, p182

- $E(R_i)$  -is the expected return of asset  $i$
- $R_f$  -is the risk-free rate of interest such as interest arising from government bonds
- $\beta_i$  -is the sensitivity of the expected excess asset returns to the expected excess market return
- $E(R_m)$ - is the expected return of the market

- $E(R_m) - R_f$  - is the market premium or risk premium (the difference between the expected market rate of return and the risk-free rate of return)
- $Cov(R_i, R_m)$  is covariance between the returns for stock  $i$  and the market portfolio
- $Var(R_m)$  is variance of the returns on the market return

The risk free rate of the German bund with maturity of more than one year and less than two years is used in estimating the risk-free rate of return. The German bund is considered one of the closest to default free because the euro is the only currency that has no single entity has the capacity to print the currency, thus supply is limited. (Damodaran, 2008, p.16). With usage of an event study that focuses on short term observation (Campbell et al., 1997, p.149), we use the relatively short term less than two years maturity German bund in our estimation. Time series data was obtained from the Deutsche Bundesbank statistical time series database (<http://www.bundesbank.de/>).

As the measure of expected stock market return, stock market indices are cited and adopted as benchmarks. Different stock indices represent the performances of specific fields of the market, like a certain size firms, a certain type of management or industry and so on. Within the European area, there are many existing indices such as FTSE100, DAX, CAC40, ATX, BEL-20, AEX General, Madrid General, Stockholm General, Swiss Market and Euronext 100. The broad based stock index Euronext 100 is used in our research as the expected market return that is defined by the Euronext Stock Exchange. The Euronext Stock Exchange is a pan-European stock exchange combining the stock exchanges of France, Belgium, Netherlands, Portugal and United Kingdom. Additionally, in cash and derivatives trades, Euronext has cross-membership and cross-access agreements with Warsaw Stock Exchange and Helsinki Stock Exchange. Therefore, to a large extent this index reflects the European financial market activities. The Euronext 100 index® consists of the largest and most liquid stocks traded on Euronext that represent the underlying European market. The composition of the Euronext 100 index® represents 80%, or 1,177 billion euro of the total market capitalization of the investment universe as of 2002. Furthermore, the Euronext 100 index® is described as the blue chip index which consists of companies having steady-going earnings, no extensive liabilities and regular dividends. Euronext 100 Index® is the benchmark index that is governed by Global Index Group of NYSE Euronext based on public rule book. The index was launched in 2 October 2000, the base date is 31 December 1999 and base level of 1000. Since then, index is calculated every 30 seconds and number of shares is reviewed on daily basis. Stocks that composite the index is selected basing on market capitalization, weighting is full market capitalization with capping of 10%. The composition and capping are reviewed semi annually. The main criteria that stocks to be included in the index is stock need to be listed on Euronext main market with liquidity test covering 12 month and velocity of 20%. The index is calculated on a price return basis and current market capitalization divided by the divisor. The divisor was determined on the initial capitalization base of index and the base level. The level of index is published every 30 seconds for days

when Euronext Markets are open for trading during time of 09:00 and 17:35 (CET). NYSE Euronext owns the index and responsible for monitoring the selection of constituents, reliable and representative view of the market. ((www.euronext.com, Rules for the Euronext 100Index® and Next 150 Index®, retrieved on May 2010 and 14 Dec 2010).

Using these parameters of the CAPM, we are able to estimate the expected normal return ( $R_{ji}$ ) for each firm security for the event periods. In order to measure the event impact we will measure the abnormal return that is actual return of the security over the event window minus the normal return of the firm over the event window. (MacKinlay, 1997, p.15)

#### ***Event Study step 4. Estimation procedure***

After selecting the normal return model to be used the parameters of the model should be estimated using the data of the estimation window. It is the period prior to the event window and in our research it is the 135 days before the event window. The event period is not included in the estimation window to prevent from influence on the normal return model parameter estimates (MacKinlay, 1997, p.20). Using the daily stock prices of firms and market index data, we estimate CAPM model parameters.

#### ***Event Study step 5: Testing procedure***

Using these parameter estimates we will calculate abnormal returns. For each firm abnormal return are defined as the difference between the estimated normal return and the market return on day  $j$ :

$$AR_{ij} = R_{ij} - R_{mi} \quad (3)$$

Where  $AR_{ij}$  is Abnormal Return (AR) of  $j$  stock on day  $i$  and  $R_{ji}$  is estimated normal return of  $j$  stock on  $i$  day.  $R_{mi}$  is the return on the market portfolio for day  $i$  using the Euronext 100 share index as the proxy for the market return. Abnormal return is as measure of the impact of the event on the value of the firms. Thus if abnormal return exists we conclude that event has an impact on the value of the firm.

Single event observations are not very useful thus it is recommended to use aggregated numbers to be able to make overall inferences. Thus cumulative abnormal return concept is used (MacKinlay, 1997, p.21). The aggregation is done through time and across securities. Aggregation through time for individual security done as follows:

$$CAR(t1, t2) = \sum_{t=t1}^{t2} AR_{it} \quad (4)$$

In order to aggregate, it is assumed that there is no overlap in the event windows of the included securities and that ARs and CARs are independent across securities. Individual securities abnormal returns can be aggregated for each event period. Sample aggregated

abnormal returns for period t is as Average Abnormal Return (AAR):

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (5)$$

Aggregation through observation is then performed with the average cumulative abnormal return (ACAR). ACAR for the N events over each window is calculated as

$$ACAR(t1, t2) = \frac{1}{N} \sum_{t=t1}^{t2} AAR_t \quad (6)$$

After defining the individual stock Abnormal Return and Cumulative Abnormal Returns, using the statistical techniques to compare the groups, the T-test and One-way analysis of variance, we test our hypothesis. First we use the parametric t-test to test our hypothesis as we met the parametric test assumptions and it is more powerful than a non parametric test (Pallant, 2007, p.210). As our observations of stock returns are measured as a ratio using continuous scale, and stock returns of our sample firms are independent, not influenced by each other, we consider that we have met the assumption of level of measurement and independence of observation. Pallant (2007, p.204) mentioned that if the sample size is above 30, the normality of the distribution is not an issue, thus we can ignore the normality assumptions of the parametric test. The parametric test that we use to test our first hypothesis as mean Abnormal Return or Cumulative Abnormal Return is equal to zero, is one sample t-test. To test our second hypothesis that Mean Cumulative Abnormal Return for qualitative and quantitative profit warning is equal, we use independent samples t-test. One way analysis of variance (ANOVA) is used to test our third hypothesis that is the Mean Cumulative Abnormal Return for size related subsamples are equal.

In order to avoid the error of rejecting the null hypothesis that is true we used different levels of alphas that 0.1, 0.05, and 0.01 respectively. Another aspect of statistical error is failing to reject a null hypothesis when it is false. To avoid this, we use a parametric test that is more powerful than a non parametric test in case the assumptions are met. The power of the test that indicates if there is a difference between groups compared, depends on the sample size, effect size, and alpha level that is used. As Stevens (1996, p.6, cited in Pallant, 2007, p.205) mentioned if the sample is large, the power is not a problem and if the sample is small, different alpha levels can be used. According to this suggestion we consider that our sample size is moderate and we adjusted different levels of alphas to increase the power of the tests. (Pallant, 2007, p.205) In addition, even though we meet the parametric test assumptions and use the more powerful parametric test we still want to use the non-parametric test to see if the results agree or contradict in order to confirm the validity of our test. In addition to the parametric mean variance analysis t-test, ANOVA, we use non-parametric tests of Mann-Whitney U test and Kruskal-Wallis tests. All the parametric and non-parametric tests are performed using

the statistical program SPSS.

Abnormal Returns are computed over the event window from five days before to five days after the profit warning covering the actual profit warning announcement day. Such a narrow time period is used because it tries to capture the sole impact that results from the interest of the event (Kasznik & Lev, 1989, p.159). Jackson & Madura (2003, p.511) found significant negative market response to profit warnings is not time sensitive for the warning before publishing the earnings announcement. They also found that adjustment of stock prices starts approximately five days in advance of a profit warning and the effect of profit warning on the market does not stop completely until about five days after the warning. Both Jackson & Madura (2003, p.512) and Bulkley & Herrerias (2004, p.11) select eleven days as tested periods and obtain valid results. Collett (2004, p.5) observed the unexpected trading volume between the five days before the announcement and the five days after it, which is the eleven day period. Similar to these studies we have eleven days as the event window.

Cumulative abnormal returns are calculated over several event windows to see the overall impact for the event window with different horizons. For example: to test whether abnormal returns evidenced around the announcement were later reversed, the cumulative abnormal returns are calculated for periods up to 60 days. If the profit warning impacts the price of the security and there are significant abnormal returns, we further analyze the difference in the impact depending on profit warning type, dividing our sample according to the profit warning type into two subsamples. Moreover, we used convenient sampling method by splitting the sample into equal amounts of small, medium and large firms on the basis of the total assets. Then we measure the profit warning impacts between the three subsamples.

#### **4.3 Validity**

According to Bryman & Bell (2007, p.40), reliability, validity and replication are the most outstanding criteria for assessing the quality of research studies. Among the three criteria, they (2007, p.41) considered the validity is most important research criterion. According to Saunders et al. (2009, p. 157), validity focuses on if the findings really present what they appear to be about. According to Bryman & Bell (2007, p.41), there are three main types of validity, measurement validity, internal validity and external validity. This criterion normally is used in the quantitative research and employed to the search for the measures of social scientific concepts (Bryman & Bell, 2007, p.41). In our research, we apply quantitative research and our topic is involved in the social scientific concepts. Therefore, we value our research from measurement validity perspective.



#### **4.4 Reliability**

Another important criterion is reliability which focuses on whether the study results are repeatable and is particularly related with quantitative research (Bryman & Bell, 2007, p.40). Saunders et al. (2009, p.156) also mention reliability and validity should be paid attention on research design in order to get the credibility of research findings and avoid obtaining the wrong answers. They think reliability concerns about the data collection techniques or analysis procedures will yield consistent findings. In our research, we collect data through the Thomson Reuter DataStream database and the companies' annual reports. During the process, we insist to be objective and there are no mistakes and bias. Through SPSS, we analyze and obtain our results objectively without any manipulation. Therefore, if the other researches do the same study in this area and collect the similar samples, they will obtain the similar result as us. The test is repeatable.

## 5. Empirical Study and Analysis

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*In this chapter, the empirical results of the various statistical tests are presented and analyzed. We present parametric mean comparison and non-parametric statistical tests result that tested our hypothesis. These tests are performed for full samples and for subsamples according to profit warning type and the firm size.*

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In the event study, the last steps are presenting empirical results and interpreting the results thus driving us into conclusion. In this chapter we will present our empirical results according to statistical parametric t- tests, and non- parametric tests.

First we use parametric t-test to test our hypotheses as we met the parametric test assumptions and it is more powerful than non parametric test (Pallant 2007, p210). As our observations, that is stock returns, are measured in ratio level using continuous scale, and stock returns of our sample firms are independent, not influenced by each other, thus we consider that our study meets the assumption of level of measurement and independence of observations. Pallant (2007, p.204) mentioned that if the sample size is above 30, the normality of distribution is not issue, thus we can ignore the normality assumptions of the parametric test. The parametric test that we use to test our first hypothesis as mean Abnormal Return or Cumulative Abnormal Return is equal to zero, is one sample t-test. To test our second hypothesis that Mean Cumulative Abnormal Return for qualitative and quantitative profit warning is equal, we use independent sample t-test. One way analysis of variance (ANOVA) is used to test our third hypothesis that is the Mean Cumulative Abnormal Return for size related subsamples are equal.

In order to avoid the error of rejecting the null hypothesis that is true we used selecting appropriate level of alphas that 0.1, 0.05, and 0.01 respectively and denoted the significance levels. Since there is another aspect of statistical error that fails to reject a null hypothesis when it is false, we use parametric test that is more powerful than non parametric test in case of assumptions are met. The power of the test that indicates if there is a difference between groups compared, depends on the sample size, effect size, and alpha level that is used. As Stevens (1996, p6, cited in Julie Pallant 2007, p205) mentioned if the sample is large power is not problem and if sample is small different alpha levels can be used. According to this suggestion we consider that our sample size has a moderate size and we adjusted different levels of alphas to increase the power of the tests. (Julie Pallant, 2007,p205). If parametric test assumptions are not met, the non-parametric test are used. Unlike the parametric tests that have certain assumptions to be met, non-parametric tests are not strict thus considered less powerful to detect the differences between the groups analyzed in comparison to parametric test (Pallant 2007, p210). For our analysis, even though parametric test assumptions are met, we use non-parametric test to verify the result of the research. If the results of the two different statistical methods find similar, our research result will be confirmed thus validity of the

research increases. Otherwise, there will be contradicting result thus reliability and validity can be questionable. We use non-parametric test Mann-Whitney U test to test if there is difference in the reaction according to profit warning type and Kruskal-Wallis test to test if there is difference in the reaction of profit warning according to the firm size.

### 5.1 Sample general analysis

We begin the analysis by introducing our sample according to the industry and the sector in the Table 4. Our sample consists of the 87 firms that cover 10 different industries and 27 sectors, and issued profit warning announcement during the period of January 2008 and April 2010. Industry and sector classification is made according to FTSE/DJI Industry Classification Benchmark (ICB), and data was obtained from Datastream database or firm websites where it needed clarifications. Firms in the Industrials industry issued 22% (19 out of 87) of the total announcements, Consumer services, Consumer goods, and Financials industries firms issued 18% (16 out of 87) of total announcements respectively. Basic Materials 10% (9 out of 87), Telecommunication industry issued 7% (7 out of 87), and Technology industry 3% (3 out of 87) of the total announcement. Healthcare and Utility industry firms only 1% of the total samples thus it can be concluded that these industries were in good condition during this financial downturn period. Most affected industries were Industrials, Consumer goods, and Consumer services.

**Table 4. The Industry classification for sample**

<b>Industry</b>	<b>Profit warnings</b>	<b>Profit warnings, %</b>
Basic material	9	10%
Consumer goods	16	18%
Consumer services	16	18%
Financials	16	18%
Healthcare	1	1%
Industrials	19	22%
Technology	3	3%
Telecommunication	6	7%
Utilities	1	1%
Total	87	100%

Note: All profit warning announcements are obtained from publicly available medias especially Financial Times ([www.FT.com](http://www.FT.com)) online international business newspaper. Classification is according to FTSE/DJI Industrial Classification System (ICB).

Then we continue the analysis with the period of profit warnings by years. In the 2008, 61% (53 out of 87), in 2009 29% (25 out of 87), and by April 2010 10% (9 out of 87) of

the profit warnings were announced respectively. If we ignore the 2010 as we did not cover the whole year, in 2008 most of the profit warnings were issued and particularly month of November 25 % (13 out of 53), and December 19% (10 out of 53). In January 2009, 28 % ( 7 out of 25) of the profit warnings were issued. From this pattern it can be seen that there were period concentration between the November 2008 and January 2009. This is due to end of the business year and firms are already aware of the earnings of the year thus issue the profit warnings to prepare the market to the bad news. It is consistent with the result of Bulkley & Herrerías (2004, p.25) research that firms issue profit warning close to earnings announcement. Moreover, it is clear that 2008 were worse for the EU firms, especially the end of year as more profit warnings were issued. The bad condition continued to beginning of the next year 2009. In addition, if we compare just first quarter of the all three years, it can be seen that 2009 was worse year then it continued but with reduced amount into 2010, can be seen as recovery from the financial crises as profit warning indicates the general economic conditions.

**Table 5. The profit warnings by month and year for total sample**

Month	2008	2009	2010	Total
January	1	7	3	11
February	3	0	5	8
March	1	4	1	6
April	1	2	0	3
May	4	0		4
June	1	2		3
July	7	1		8
August	4	2		6
September	1	0		1
October	7	4		11
November	13	3		16
December	10	0		10
Total	53	25	9	87

In table 6, we analyze the profit warnings by issued firm country where head office is located. For our collected sample, United Kingdom and France firms are issued more profit warnings during the cover period than other EU countries. Respective numbers are United Kingdom 46% (36 out of 87) and France 21% (18 out of 87). Nederland and Switzerland firms list in the rank with 6 and 5 firms.

**Table 6. The profit warnings by country for total sample**

Country	Profit warning
Belgium	1
Denmark	1
Finland	2
France	18
German	7
Ireland	3
Italy	2
Nederland	6
Norway	2
Scotland	1
Sweden	1
Swiss	2
Switzerland	5
United Kingdom	36
Total	87

## 5.2 Parametric test result

The results of the parametric one sample t-test testing the hypothesis that Mean Abnormal Return or Cumulative Abnormal Return is equal to zero are presented in the Table 5. This includes pre- announcement, announcement day, and post announcement days Abnormal Returns and Cumulative Abnormal Returns for total sample and sub samples according to profit warning type. Quantitative warnings are profit warnings that include a forecast for the scheduled earnings announcement to which they refer and 46% of the total sample is quantitative profit warning announcements. Qualitative warnings are profit warnings that provide the guidance about earnings will be below current expectations and 64% of the total sample is qualitative profit warning announcements. Daily abnormal returns for an individual stock are calculated as the daily return on the stock minus the daily expected normal return which was calculated by CAPM expected return model. AR measures daily average abnormal return of warning stock. CAR records the cumulative value of AR up to each day. Days are measured relative to the day of the warning.

**Table 7. Abnormal Returns and Cumulative Abnormal Returns for the pre-announcement, for actual day of announcement, and post- announcement periods for full and subsamples according to profit warning type.**

Day		All		Qualitative		Quantitative	
		AR	CAR	AR	CAR	AR	CAR
-5	Mean	-3,15	-3,15***	-3,37	-3,37	-2,88	-2,88
	st Dev	1,16		1,08		1,20	
	t-test	-25,391***					
	min	-4,27					
	Max	-0,99					
-4	Mean	-3,15	-6,29***	-3,37	-6,74	-2,89	-5,77
	st Dev	1,16		1,09		1,20	
	t-test	-25,35***					
	min	-4,62					
	Max	-1,03					
-3	Mean	-3,14	-9,44***	-3,37	-10,10	-2,88	-8,65
	st Dev	1,15		1,08		1,20	
	t-test	-25,40***					
	min	-4,35					
	Max	-1,02					
-2	Mean	-3,13	-12,57***	-3,36	-13,47	-2,86	-11,52
	st Dev	1,16		1,08		1,20	
	t-test	-25,23***					
	min	-4,36					
	Max	-1,04					
-1	Mean	-3,17	-15,74***	-3,39	-16,86	-2,90	-14,42
	st Dev	1,17		1,10		1,22	
	t-test	-25,18***					
	min	-4,54					
	Max	-1,05					
0	Mean	-3,21	-18,94***	-3,40	-20,25	-2,98	-17,40
	st Dev	1,15		1,08		1,21	
	t-test	-25,94***					
	min	-4,61					
	Max	-1,15					
1	Mean	-3,16	-22,10***	-3,37	-23,63	-2,90	-20,31
	st Dev	1,15		1,08		1,19	
	t-test	-25,53***					
	min	-4,29					
	Max	-1,01					
2	Mean	-3,15	-25,25***	-3,36	-26,99	-2,89	-23,20

	st Dev	1,15		1,08		1,19	
	t-test	-25,50***					
	min	-4,30					
	Max	-1,06					
3	Mean	-3,14	-28,38***	-3,36	-30,34	-2,88	-26,08
	st Dev	1,15		1,08		1,20	
	t-test	-25,40***					
	min	-4,24					
	Max	-1,05					
4	Mean	-3,14	-31,52***	-3,36	-33,70	-2,88	-28,96
	st Dev	1,15		1,08		1,20	
	t-test	-25,44***					
	min	-4,34					
	Max	-1,03					
5	Mean	-3,14	-34,66***	-3,37	-37,07	-2,88	-31,84
	st Dev	1,15		1,08		1,19	
	t-test	-25,46***					
	min	-4,33					
	Max	-1,04					
	N=	87,00		47		40	

Notes: \* Denotes statistical significance at the 0.1 level, \*\*denotes statistical significance at the 0.05 level,\*\*\* denotes statistical significance at the 0.01 level.

Table 5 results indicate that Mean Abnormal returns and mean Cumulative Abnormal Returns for event windows are all statistically significantly different from zero thus our null hypothesis that the average market reaction is zero, is rejected at 0,01% significance level for all window. The most significant negative impacts are occurring around one day before profit warning with mean size of -3,17% ( $t = -25,18^{***}$ ), on the event day 0 with the mean size of -3.21% ( $t = -25,94^{***}$ ), and one day after the event with mean size of -3.16% ( $t = -25,53^{***}$ ). For our total sample, the notable statistically significant abnormal return is noticed on the day of the profit warning is announced.

Profit warning results in cumulative fall in price for all sample 35% (CAR) during these event windows. Pre- announcement ARs are all negative and significant at 0, 1% level and ranged from -3.15% to -3.17% ( $t =$  ranged from -25.4 to -25.2). This result supports the idea of there was information leak prior to the announcement. Negative and significant pre-announcement market reaction could be due to condition of general economy or industry that was weak or insider leaks to analysts and investors. (Jackson & Madura, 2003, p.507). Moreover, Table 5 confirms that the reaction to qualitative profit warning is more negative than reaction to quantitative warnings with mean AR for the qualitative profit warning is -3.4% while mean quantitative AR is -2.98% for the actual announcement day. Cumulative Abnormal return for the pre-announcement period until one day before the announcement is -16.89% for qualitative whereas -14.42% for quantitative profit warning announcement. Similar trend is noticed for post

announcement period until 5 days after profit warning announcement as Cumulative Abnormal Returns are -37.07% for qualitative and 32.0% for quantitative announcements. This trend confirms the result of Bulkley & Herrerias (2005, p.611), that qualitative warning is considered by market as bad news and its impact is more negative than quantitative one.

Following Table 6 presents the result of our second hypothesis testing that mean Abnormal Return or Cumulative Abnormal Return for qualitative and quantitative profit warning are equal or there is no difference in the impact of the profit warning according to profit warning type. We test this hypothesis using the statistical method of mean comparison independent t-test that draws two samples from the same population.

**Table 8. Mean CAR comparisons according to profit warning type for event windows**

		All	Qualitative	Quantitative	Mean Difference	t-test
CAR( -5:-1)	Mean	-15,74	-16,86	-14,42	-2,43	-1,99**
	St D	5,79	5,42	6,01		
	Min	-21,475				
	Max	-5,14				
CAR 0	Mean	-18,94	-20,25	-17,40	-2,85	-1,94*
	St D	6,94	6,50	7,21		
	Min	-26,073				
	Max	-6,37				
CAR (-1:+1)	Mean	-9,53	-10,16	-8,79	-1,37	-1,87*
	St D	3,47	3,26	3,61		
	Min	-13,229				
	Max	-3,29				
CAR (-1:0)	Mean	-6,37				
	St D	2,32	-6,79	-5,88	-,90	-1,83*
	Min	-8,957	2,17	2,42		
	Max	-2,28				
CAR(0:1)	Mean	-6,36	-6,77	-5,88	-,89	-1,81*
	St D	2,30	2,16	2,40		
	Min	-8,881				
	Max	-2,25				
CAR (1:5)	Mean	-15,72	-16,82	-14,44	-2,38	-1,95*
	St D	5,76	5,39	5,97		
	Min	-21,308				
	Max	-5,19				
CAR(2:10)	Mean	-28,29	-30,26	9,70	-4,28	-1,95*
	St D	10,36	-25,97	10,75		
	Min	-38,459				



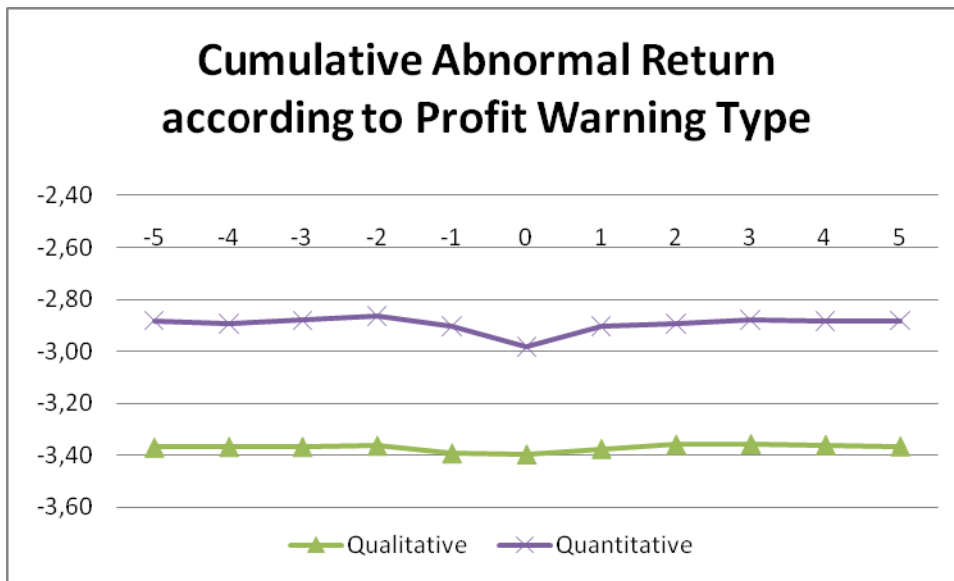
	Max	-9,38				
CAR(11:60)	Mean	-156,87	-167,90	-143,91	-23,99	-1,97*
	St D	57,41	53,82	59,44		
	Min	-213,163				
	Max	-51,97				
<hr/>						
	N=	87	47	40		
<hr/>						

Notes: \* Denotes statistical significance at the 0.1 level, \*\*denotes statistical significance at the 0.05 level,\*\*\* denotes statistical significance at the 0.01 level.

The result of the test indicates that there is statistically significant difference in the mean CARs for the quantitative and qualitative profit warnings thus rejects our null hypothesis that mean ARs or CARs for the quantitative and qualitative profit warnings are equal. The mean difference between the subsamples for pre-announcement window, CARs for the 5 days and day before the profit warning is -2.43 (t=-2.0\*\*) at significance level of 0.05%, on the actual day of profit warning is -2.85% (t=-1.94\*) at significance level of 0.1%, and for post announcement window, CARs 5 days after the announcement is 2.38 % (t=-1.95\*) at significance level of 0.1%. The Mean difference between two types of profit warning during the post event window two to ten days after profit warning announcement is -4.28% (t=-1.95\*) and for window eleven to sixty days -23.99% (t=-1.97\*) at significance level of 0.1%.

In the following figure the Cumulative Abnormal Returns for two types of profit warnings are plotted over the event periods. From the plot it is obvious that market response to the profit warnings on the day of the announcement is noticeable, especially for the quantitative profit warnings. Then for the post event window, the abnormal return bounced back to the previous level as in the pre-event window. Even though similar market reaction is not observable for the qualitative profit warning, it has more negative impact than the quantitative profit warning.

**Figure 6. Cumulative Abnormal Return Plot according to the profit warning type**



The next analysis we present is related to the third hypothesis that mean Abnormal Return or Cumulative Abnormal Return is equal to for small, medium and large size firms. The total sample was classified into three equal amounts of sub samples according to their total asset size using the convenient sampling method. Then the statistical one way analysis of variance (ANOVA) method is used in comparing the mean scores of small, medium, and large sized firms' reaction to the profit warning. ANOVA tells whether there are significant differences in the mean scores on the dependent variable across the three groups. Then post hoc tests, reveals where these differences lie.

**Table 9. Mean cumulative abnormal returns for the small, medium, and large firms, ANOVA**

						ANOVA
		All	Large	medium	small	F-value
CAR (-5:-1)	Mean	-15,74	-15,40	-15,90	-15,92	0,075 (0,928)
	StDev	5,79	5,97	5,64	5,96	
	Min	-21,47	-21,46	-21,40	-21,46	
	Max	-5,14	-5,51	-6,06	-5,51	
CAR 0	Mean	-18,94	-18,50	-19,18	-19,15	0,088 (0,916)
	StDev	6,94	7,15	6,76	7,14	
	Min	-26,07	-25,68	-25,63	-26,07	
	Max	-6,37	-6,37	-7,29	-6,73	
CAR(-1:+1)	Mean	-9,53	-9,29	-9,67	-9,63	0,107 (0,899)
	StDev	3,47	3,57	3,39	3,57	
	Min	-13,23	-12,95	-12,77	-13,23	

CAR (-1:0)	Max	-3,29	-3,29	-3,63	-3,42	0,113 (0,893)
	Mean	-6,37	-6,20	-6,47	-6,44	
	StDev	2,32	2,39	2,25	2,39	
	Min	-8,96	-8,74	-8,50	-8,96	
CAR(0:1)	Max	-2,28	-2,28	-2,44	-2,32	0,134 (0,875)
	Mean	-6,36	-6,18	-6,48	-6,42	
	StDev	2,30	2,36	2,26	2,36	
	Min	-8,88	-8,42	-8,55	-8,88	
CAR (1:5)	Max	-2,25	-2,25	-2,42	-2,32	0,080 (0,924)
	Mean	-15,72	-15,37	-15,91	-15,89	
	StDev	5,76	5,91	5,64	5,90	
	Min	-21,31	-21,03	-21,31	-21,11	
CAR(2:10)	Max	-5,19	-5,19	-6,05	-5,56	0,82 (0,921)
	Mean	-28,29	-27,65	-28,61	-28,61	
	StDev	10,36	10,64	10,15	10,62	
	Min	-38,46	-37,78	-38,46	-37,98	
CAR(11:60)	Max	-9,38	-9,38	-10,91	-9,97	0,096 (0,909)
	Mean	-156,87	-153,02	-158,60	-158,99	
	StDev	57,41	58,73	56,11	59,19	
	Min	-213,16	-208,33	-212,36	-213,16	
	Max	-51,97	-51,97	-60,63	-55,33	
N=		87,00	29,00	29,00	29,00	

Table 7, illustrates that there are no statistically significant differences between the firms with different size according to total asset as the ANOVA F-test values are small and not significant. Therefore, the third hypothesis is accepted that there are no differences between the mean cumulative abnormal returns for small, medium and larger firms. During the pre-event window five days before, and the post event window next sixty days of the profit warning announcement, the negative impact is more pronouncing for the small firms than the medium and large firms. However, for the rest of the event windows, the medium sized firms are slightly more impacted than the large and small size firms. The exception is for the event window two to ten days after the profit warning where the mean cumulative abnormal returns are same -28.61% for small and medium firms. Though, the differences in the impacts are not significant.

**Table 10. Mean cumulative abnormal return differences between the size sub samples ANOVA post hoc test**

Event window	Firm size	Large	Medium	Small
CAR( -5:-1)	Large		0,51	0,52
	Medium	-0,51		0,01
	Small	-0,52	-0,01	
CAR 0	Large		0,69	0,65

	Medium	-0,69		-0,04
	Small	-0,65	0,04	
CAR (-1:+1)	Large		0,39	0,34
	medium	-0,39		-0,05
	small	-0,34	0,05	
CAR (-1:0)	Large		0,27	0,24
	medium	-0,27		-0,03
	small	-0,24	0,03	
CAR(0:1)	Large		0,30	0,24
	medium	-0,30		-0,06
	small	-0,24	0,06	
CAR (1:5)	Large		0,54	0,52
	Medium	-0,54		-0,02
	Small	-0,52	0,02	
CAR(2:10)	Large		0,96	0,97
	Medium	-0,96		0,00
	Small	-0,97	0,00	
CAR(11:60)	Large		5,58	5,97
	Medium	-5,58		0,39
	Small	-5,97	-0,39	

---

Post hoc test reveals that if there is any difference between the firms and where this differences lie. There is a positive but small 0.04% difference between the mean cumulative abnormal return for the small and medium firm and negative but small -0,69 % difference between small and large firms on the day of the profit warning announced. During the post-event window of eleven to sixty days there are negative but large -5,58% and -5.97% differences between the large and medium, large and small firms. However, all these differences are statistically not significant thus our null hypothesis is accepted.

### 5.3 Non-parametric test result

In addition to parametric t-tests we analyzed the data with non-parametric tests. The non-parametric test Mann-Whitney U test for analyzing the profit warning impact difference between the quantitative and qualitative profit warnings, confirmed the parametric test result.

**Table 11. Mean CAR comparisons according to the profit warning type for event windows. Non-parametric, Mann-Whitney test**

		All	Qualitative	Quantitative	Z value
CAR( -5:-1)	Median	-18,98	-19,76	-17,70	-2,33**
CAR 0	Median	-22,80	-23,76	-21,33	-2,21**
CAR (-1:+1)	Median	-11,39	-11,92	-10,72	-2,134**
CAR (-1:0)	Median	-7,63	-7,97	-7,14	-2,02**
CAR(0:1)	Median	-7,59	-7,95	-7,21	-1,91*
CAR (1:5)	Median	-19,00	-19,73	-17,81	-2,26**
CAR(2:10)	Median	-34,25	-35,48	-31,98	-2,29**
CAR(11:60)	Median	-189,66	-197,18	-177,83	-2,41**
N=		87	47	40	

Notes: \* Denotes statistical significance at the 0.1 level, \*\*denotes statistical significance at the 0.05 level, \*\*\* denotes statistical significance at the 0.01 level.

The median scores for the all and sub-samples are ranked with Mann-Whitney U test. Test results indicate that the difference between the profit warning types impacts are statistically significantly different from each other at 0.05% level for event windows except on the actual day and the day after window where the significance level is at 0.1%. Non- parametric test result confirms that there are significant differences between the impact of the qualitative and quantitative profit warnings. Table 9 shows that qualitative profit warning has more negative impact than the quantitative one, as ranked in the table. The median CARs for the pre-event window were -19,76% for qualitative profit warning , and -17.70% for quantitative warning with z value -2.33%, significant at 0,05% level. On the actual day of the profit warning the median CAR for the

qualitative profit warning was -23.76% ,whereas, -21.33% for the quantitative with z value -2.21% at significance level of 0,01%. The previous finding that the qualitative profit warning has more negative impact than the quantitative one is remained, until the sixty days after the profit warning. The median rankings were -197,18% and -177.83% respectively with z value -2.41 at the 0.05% significance level.

**Table 12. The Mean Cumulative Abnormal Return Difference for the small, medium and large firms. Non parametric Kruskal-Wallis test result**

		All	large	Medium	Small	Chi-Square
CAR( -5:-1)	Mean	-18,98	-19,0	-19,3	-19,8	0,70 (0,71)
CAR 0	Mean	-22,80	-22,7	-23,2	-23,8	0,93(0,627)
CAR (-1:+1)	Mean	-11,39	-11,4	-11,7	-11,9	0,99 (0,608)
CAR (-1:0)	Mean	-7,63	-7,6	-7,7	-8,0	0,76(0,684)
CAR(0:1)	Mean	-7,59	-7,6	-7,7	-7,9	1,66 (0,436)
CAR (1:5)	Mean	-19,00	-19,0	-19,3	-19,6	0,83(0,659)
CAR(2:10)	Mean	-34,25	-34,2	-34,8	-35,5	0,98 (0,612)
CAR(11:60)	Mean	-189,66	-189,6	-192,5	-197,7	1,33 (0,513)
N=		87	29	29	29	

In non-parametric, Kruskal -Wallis Test, CARs converted to the ranks and the mean ranks for each firm are compared. (Pallant, 2007, p.226). The test result indicates that there are no statistically significant difference in CARs across the three different firm size with chi square  $\chi^2 = 0,697$ ,  $p = 0,706$ . This result confirms the parametric test result

that we tested earlier using ANOVA. However, the rankings of which firms is impacted more is not similar with previous parametric test. According to the parametric test the medium sized firms were impacted more negatively, while in the non-parametric test results it shows that the small firms have more negative impact than the other firms. For instance: on the actual day of the announcement mean CARs for the small firms were -23.8%, medium firms -23.2%, large firms -22.7% with  $\chi^2 = 0.697$  ( $p=0.627$ ). In the parametric test result it was the medium size firms that have more negative mean CARs on the same event day.

## 6. Conclusion and Recommendations

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*In this part, final results and recommendations will be presented as conclusion. In addition, we will give some suggestions to the future research.*

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### 6.1 Conclusion

One of the price sensitive information disclosures that are issued in the public is the profit warnings from the firms. The firms that fail to meet the market expectation regarding the expected earnings issue the profit warnings. The management must decide when and how to reveal such price sensitive information as it reveals the actual earnings will be lower than the expected one. The consequence of such transparency is that it impacts in the security price of the firm, mostly negatively. The profit warning is the pure information, unscheduled, and unexpected corporate announcement that is issued prior to the actual earnings announcement with the purpose of informing the market thus reducing the negative impact of the earnings surprise (Bulkley & Herrerias, 2004, p.5; Collet, 2004, p. 4; Claude, 2008, p.318). As the information, the profit warnings reduce the information asymmetry and improve the transparency in the market. Due to its significant impact on the security price, firms are reluctant to issue the profit warning. However, there are several market incentives that make the firms to issue it. The first is firms avoid from the legal liability and lawsuit by issuing the profit warning. If they do not meet the promised earnings and keep silent regarding the situation the consequence of such information advantage is legal and it might be huge. Especially, if the earning surprise is large (Helbok & Walker 2003; Holland 1998). The second is willingness to have good reputation with investors and maintain good relationship with banks, institutional investors as they appreciate the transparency from the firms. It will help the firms to meet their corporate financing and controlling demand. Moreover, the reputation in the labor market and credit rating is connected with this incentive. The third reason is, if firms fail to disclose the bad news they take the risk of confronting the high cost of capital through share price decrease and liquidity reduction. The forth is, in some countries it is legally required to inform the investors regarding the earnings expectation failure. These are the main incentives that influence the firms to issue the profit warnings regardless of significant negative impact on the stock price. Therefore, it can be concluded that profit warning is complex in nature as it is issued regardless of its significant negative impact on the stock price.

The complexity and the influence on the stock price make the profit warning, one of the important corporate events that attract the attention of the researchers and firms. Moreover, it is considered new event that started to appear in the late 1990s with increasing numbers. There are several studies, especially, focused on the UK or US market, however few in the EU area. The profit warning is issued more when the economy is bad, because it reveals the general economic condition. During the last two years the global economy experienced the financial crises and the profit warning have



been issued frequently and massively by firms. Furthermore, the profit warning has two forms: quantitative and qualitative and the impacts are not similar. The qualitative is considered as bad news and has more negative impact than the quantitative one according to the previous researches. Quantitative profit warning includes the numerical expressions as point or range earnings estimates while qualitative is expressed without specific estimation, only indicating the earnings will be below the current expectations. In addition, according to the previous researches, the impact of the profit warning varies with the firm size. The small firms are more negatively impacted than the large firms. Due to its complex nature and its importance to the financial market and firms we chose this subject and the geographical area. We raised the research question whether the profit warning impacts the stock return in EU area. Furthermore, we investigated, if the impact of the profit warning differs according to the profit warning type and the firm size.

We collected the profit warning announcement of the EU firms that issued the profit warnings during the last twenty eight months and using the conventional event study method analyzed the impact of the profit warning in the EU area. The result of our research indicates that profit warning has impact on the stock return in EU area and the impact is negative and significant for the period of pre-warning and post-warning and on the day of actual announcement. The more significant impact is noticed during the period from one day before to one day after the profit warning. It may indicate the information leakage prior to the profit warning and the market observes the information quickly thus reacts significantly during these days. This finding supports the market efficiency assumption in the EU area. Moreover, such market response can be related to the weak economic condition during this period. During the five days before and the five days after the profit warning, the average share price response was -35%. This is interpreted as, on average, for every 100 million euro in market value, the firm experiences a 35 million loss in market value.

The reversal of the cumulative abnormal return back to the previous level after the day of the profit warning may indicate the evidence of the overreaction. Such overreaction can be explained due to representativeness as the heuristic driven bias. Maybe as the economic condition is weak and market already has saturated with the bad news, investors overreact to the additional bad news and assume it will continue in the incoming period thus overreact. Furthermore, our result confirms the previous researches result that qualitative profit warning is considered as bad news. In our result the qualitative profit warning has more negative impact than the quantitative profit warning. Due to anchoring and adjustment in decision making, people look for the anchor like stock price that is in our case, the number estimates in the profit warning and make adjustment to the decisions. Therefore, if people look the earnings estimates that are expressed in the range or point numbers, they stick to that and if the firms fail to meet that expectation they overreact. People are slow in changing the previous belief and they are conservative. Thus, firms prefer to issue the qualitative profit warning which will not provide any clear comparison in terms of no anchor. Our result indicates

that investors in the EU area under react to the qualitative profit warning as the impact of the qualitative profit warning is indeed more negative than the quantitative profit warning. Moreover, the results of the analysis that whether the impacts of the profit warning differ according to the firm sizes indicate that there are no significant differences. However, the general pattern in observation is small and medium sized firms are more negatively impacted than the large firms.

During the covered period, the industries that have unpleasant condition were Industrials and Consumer Services and Consumer Goods. The industry that has few firms issued the profit warning were Healthcare and Utilities, and it indicating that these industries were performing well during the difficult economic condition. There was period concentration for the end of 2008 and beginning of 2009 as majority of the sample issued profit warnings during this period. This can be related to the general economic condition during this period and firms issued profit warnings. Moreover, the countries that issued the most profit warnings were United Kingdom and France. It might be related to regulation and economic conditions.

In overall, we conclude that profit warning impacts significantly the stock return in the EU area by creating the abnormal return during the announcement period. This impact differs according to the profit warning type. A qualitative profit warning has more negative impact than the quantitative one; however, there is no evidence of a clear impact difference according to the firm size.

## **6.2 Recommendations**

Based on our research, we first recommend to the investors or practitioners in the market that as the profit warning is the information event that influences the investment decision, it is worth to pay attention to the profit warning type. Due to heuristics in the nature of the human behavior we are not aware of the unclearly stated information, like qualitative profit warning, as it is framed in certain terms. In fact, it has more negative impact in the stock return than the quantitative one. Therefore, when making the investment decision, it needs to be considered as it may lead to opportunity to gain an abnormal return.

Second, we recommend the firms that operating or considering operating in the EU area, to be aware that a profit warning has a significant impact on the stock returns in this geographical area, especially during the period of the actual announcement. Moreover, the choice of the profit warning type can alter the impact thus managers should consider it in the decision making regarding the profit warning issue so that they manage the drastic decline in the firm value.

### **6.3 Further research**

As we promoted, the profit warning is complex issue that needs to be studied and further researches can be done in the following area. The EU has several countries that have different regulations regarding the profit warning issuance as compulsory or voluntary. It would be useful to study in which country it is compulsory and voluntary and if the impact differs between them. Moreover, it is interesting to research the impact difference between the actual earnings announcement and the profit warning in this geographical area.

The impact on the financial derivatives linked to each stock will be also interesting and worth to study as the stock price that has impacted by profit warning is the base for these instruments.

It is also interesting if further researchers study the impact differences of several profit warnings issued by the same firm and compare the effects. Firm specific characters or industry and sector analysis can be also useful.

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## APPENDIX 1. LIST OF COMPANIES

<b>No.</b>	<b>Name</b>	<b>Date of PW</b>	<b>PW type</b>	<b>Industry</b>	<b>Total Asset/million euro</b>	<b>Country</b>
1	Aalberts industries	2008.12.16	quantitative	Industrials	1 434,50	Netherland
2	ABB	2008.12.19	qualitative	Industrials	21 229,48	Switzerland
3	Accor	2010.01.19	quantitative	Consumer service	11 746,00	France
4	Accsys	2009.10.15	qualitative	Industrials	115,47	United Kingdom
5	ADP	2009.6.18	quantitative	Industrials	7 303,64	France
6	Agta records	2010.2.10	quantitative	Industrials	200,00	Switzerland
7	Air France KLM	2009.1.20	qualitative	Consumer service	28 773,00	France
8	AMG	2009.1.5	quantitative	Industrials	788,45	Netherland
9	Arkema	2009.3.5	quantitative	Basic material	4 473,00	France
10	AXA	2008.11.25	quantitative	Financials	722 926,98	France
11	BAM	2010.02.16	quantitative	Industrials	2 089,70	Netherland
12	BASF	2008.11.19	qualitative	Basic material	46 802,00	German
13	Bluebay asset management	2008.06.16	quantitative	Financials	152,78	United Kingdom
14	BMW	2008.08.01	quantitative	Consumer goods	22 616,00	German
15	BNP Paribas	2008.12.17	quantitative	Financials	1 694,45	France
16	Bovis homes	2008.05.06	quantitative	Financials	1 298,36	United Kingdom
17	British airway	2009.01.26	quantitative	Consumer service	13 975,45	United Kingdom
18	BT group	2008.10.31	qualitative	Telecommunication	877,69	United Kingdom
19	Bulgari	2008.11.22	quantitative	Consumer goods	1 245,44	Italy
20	Burberry	2008.11.19	quantitative	Consumer goods	1 204,55	United Kingdom
21	Cable and wireless	2009.11.05	qualitative	Telecommunication	4,31	United Kingdom
22	Carpetright	2010.03.23	qualitative	Consumer service	386,24	United Kingdom
23	Carrefour	2008.12.18	qualitative	Consumer service	51,93	France
24	Centrica	2008.05.12	quantitative	Utilities	16 114,14	United Kingdom

25	Continental	2008.09.13	quantitative	Consumer goods	27 737,60	German
26	CRH	2008.11.11	quantitative	Consumer goods	19 788,00	Ireland
27	Daimler	2008.07.24	quantitative	Consumer goods	135 094,00	German
28	Dairy crest group	2008.11.10	qualitative	Consumer goods	1 621,37	United Kingdom
29	Danisco	2009.03.02	qualitative	Basic material	372,13	Denmark
30	Deutch telecom	2009.04.21	quantitative	Telecommunication	123 100,00	German
31	Deutsche Bank	2009.01.14	quantitative	Financials	2 202 423,00	German
32	DSG International	2008.01.03	qualitative	Consumer goods	14 391,23	United Kingdom
33	EasyJet	2008.03.20	quantitative	Consumer service	3 606,03	United Kingdom
34	Ericsson	2009.3.20	quantitative	Telecommunication	26 102,14	Sweden
35	Euler hermes	2008.12.03	quantitative	Financials	4 887,55	France
36	Ferrexpo	2008.10.30	qualitative	Basic material	652,60	Switzerland
37	France Telecom	2009.04.29	qualitative	Telecommunication	4 413,54	France
38	Game group	2010.1.13	quantitative	Consumer service	822,11	United Kingdom
39	Henderson group	2009.07.16	qualitative	Financials	823,31	United Kingdom
40	Icap	2010.2.5	qualitative	Financials	70 079,92	United Kingdom
41	IMS	2008.08.21	quantitative	Basic material	845,98	France
42	Inchcape	2008.12.15	qualitative	Consumer goods	3 733,16	United Kingdom
43	KBC	2008.12.29	quantitative	Financials	355 596,99	Belgium
44	Ladbrokes	2009.10.7	quantitative	consumer service	1 350,69	United Kingdom
45	Laird	2008.11.19	quantitative	Consumer goods	1 076,00	United Kingdom
46	Lloyds	2009.1.30	qualitative	Financials	132 993,45	United Kingdom
47	Logitech	2009.1.6	qualitative	Technology	967,31	Switzerland
48	Lonza	2009.10.29	qualitative	Industrials	26 838,84	Swiss
49	Lonza	2009.10.29	quantitative	Basic material	3 468,79	Swiss
50	L'oreal	2008.10.30	quantitative	Consumer goods	23 201,00	France

51	Lufthansa	2008.11.3	quantitative	consumer service	22 320,00	German
52	Marks and Spenser	2008.07.02	qualitative	consumer service	8 997,41	United Kingdom
53	Micheal Page	2008.12.5	qualitative	Industrials	467,35	United Kingdom
54	Michelin	2008.07.30	quantitative	Consumer goods	16 449,00	France
55	Moss bros	2008.02.25	qualitative	Consumer goods	114 860,94	United Kingdom
56	Mouchel group	2009.06.18	qualitative	Industrials	5 360,96	United Kingdom
57	Nexity	2008.10.09	quantitative	Financials	5 302,49	France
58	Nokia	2008.11.14	qualitative	Technology	37 599,00	Finland
59	Norsk Hydro	2008.02.19	qualitative	Basic material	1 888,36	Norway
60	Northern food	2008.05.27	quantitative	Consumer goods	0,79	United Kingdom
61	NRJ group	2009.03.26	qualitative	Consumer service	695,12	France
62	Ordina	2008.11.26	quantitative	Technology	567,10	Netherland
63	Paddy power	2008.08.27	quantitative	consumer service	177,31	Ireland
64	Qinetiq Group	2009.11.25	qualitative	Industrials	2 174,27	United Kingdom
65	Rautaruukki	2008.7.30	quantitative	Basic material	2 835,00	Finland
66	REC	2010.02.12	qualitative	Industrials	37 538,55	Norway
67	Renault	2008.10.23	quantitative	Consumer goods	68 198,00	France
68	Rentokil	2008.7.25	quantitative	Industrials	2 500,17	United Kingdom
69	Royal Bank Scotland	2008.10.13	qualitative	Financials	2 112 039,81	Scotland
70	Ryanair holdings	2008.2.4	qualitative	Consumer service	5 691,25	Ireland
71	Savills	2008.12.17	qualitative	Financials	730,74	United Kingdom
72	Shanks	2010.2.2	qualitative	Industrials	1 162,30	United Kingdom
73	Smith & Nephew	2008.5.1	qualitative	Healthcare	294,42	United Kingdom
74	Société Générale	2010.1.13	quantitative	Financials	1 023 700,99	France
75	Stagecoach group	2009.01.08	quantitative	Industrials	1 758,42	United Kingdom
76	Swiss life holding	2008.11.13	qualitative	Financials	108 618,72	Switzerland
77	Taylor wimpey	2008.11.11	quantitative	Industrials	10 424,51	United

						Kingdom
78	Thales	2009.11.11	qualitative	Industrials	17 935,70	France
79	Tomtom	2008.04.07	qualitative	Consumer goods	1 969,59	Netherland
80	Trinity Mirror	2008.07.01	quantitative	consumer service	2 735,94	United Kingdom
81	Unicredit	2008.08.29	qualitative	Financials	1 014,32	Italy
82	Wellstream hold	2009.8.20	qualitative	Industrials	401,15	United Kingdom
83	Veolia environ	2008.10.21	quantitative	Industrials	46 306,90	France
84	Victrex	2008.12.1	qualitative	Basic material	282,07	United Kingdom
85	William Hill	2009.8.4	qualitative	Consumer service	2 180,49	United Kingdom
86	Vodafone	2008.7.22	quantitative	Telecommunication	159 907,86	United Kingdom
87	Wolters Kluwer	2008.11.05	quantitative	Consumer service	5 276,00	Netherland







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