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STOCK PRICE REACTION TO LAYOFF ANNOUNCEMENTS IN FINLAND: INTER-INDUSTRY DIFFERENCES

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ABSTRACT

The purpose of this study is to find out whether a permanent layoff announcement given in the Finnish stock market cause a stock price reaction. More importantly this study aims to research whether the stock price reaction is different across industries. The chosen industries - technology, manufacturing, and consumption goods and services - cover three quarters of all the companies listed in the Nasdaq OMX Helsinki Stock Exchange when measured by daily trading volume. Additionally, the differences in abnormal returns between business cycles are researched.

The data consists of 257 permanent layoff announcements given by 66 companies operating in one of the three industries under observation. Share prices' development was observed during investigation period of 2006–2011. An event study methodology is used to investigate the share price reactions caused by permanent layoffs. Abnormal returns are examined for 11 days - four days before the announcement day and six days after it.

Permanent layoff announcements do not cause statistically significant stock price reactions when the whole sample is considered. Inter-industry differences do exist in the Finnish market. When studying industries separately, the technology portfolio was the only industry that did not react to layoff announcements. The differences in abnormal returns between service-oriented companies and manufacturing companies were also examined and the results showed that service-oriented companies face slightly more negative reaction than manufacturing companies. Different economical situations did affect investors' reactions to layoff announcements. Layoffs given during downturn periods did cause a more negative stock price reaction compared to ones given during upturn periods.

KEYWORDS: Permanent layoff announcements, market reaction, inter-industry differences, event study methodology

1. INTRODUCTION

Finland is for the second time in a short period of time within the throes of change. Prolonged economic downturn began in 2007, although the deep recession during the early 1990s is still fresh in memory. After the recession in the early 1990s, Finland experienced almost a decade lasting exceptionally rapid economic growth, which resulted in a remarkable fall in the unemployment rate. Now the economic situation is recovering, but the unemployment rate has stayed somewhat the same for few years.

The negotiations of the terminations during the prevailing downturn are continuing and even more workers are unemployed. In Finland alone between 2008 and 2011 the number of laid-off employees is exceedingly high. Companies are continuing negotiations regarding personnel reductions and even closing factories. However, according to Chen, Mehrotra, Sivakumar and Yu (2001) corporate layoffs are a rational and reasoned decision, which aims to ensure the company's survival in the future. Figure 1 below illustrates the redundancy of personnel amounts from the beginning of 2006 to the end of 2011 in all companies in Finland.

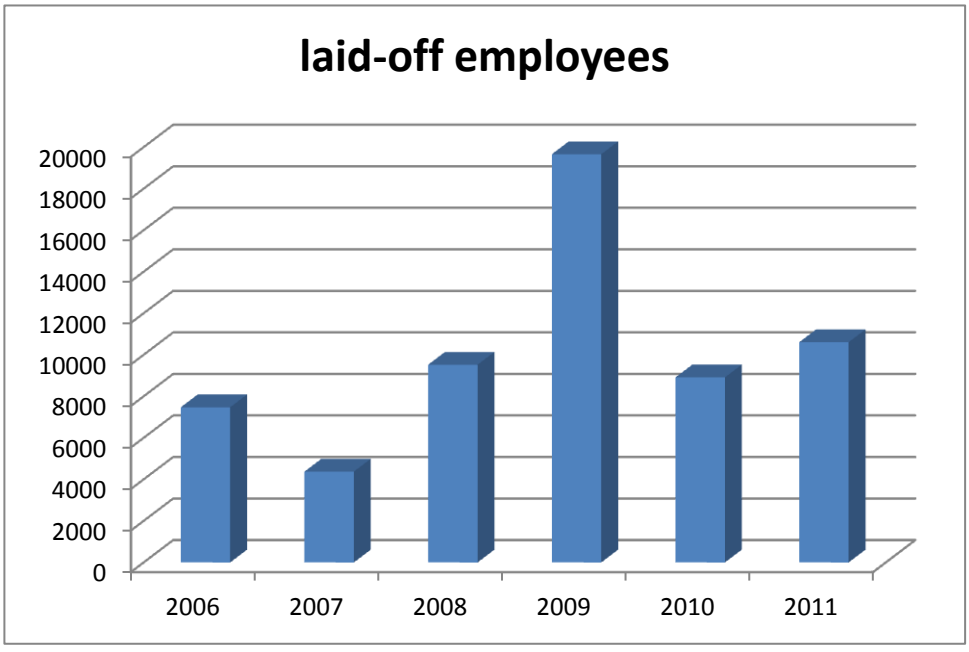

Figure 1. The number of laid-off employees in Finland. (Suomen ammattiliittojen keskusjärjestö.)

Certain studies (see, eg. Worrell, Davidson and Sharma 1991 and Chen et al. 2001) show that a company giving a layoff announcement has an impact on the company's market value -usually a negative impact, to be precise. The lowest stock returns are often attached to a situation where the layoffs are resulting from a fall in demand. The market reaction caused by a layoff announcement may vary between different time periods, and therefore the latest data may reveal a new way of share price behavior around the notice of termination. The stock market reaction consequent upon a layoff announcement may be particularly affected by the general economic situation. Farber and Hallock (2009) discovered that the number of layoff announcements follow the business cycle quite closely. Investors' differing views on corporate announcements during economical upturn and downturn periods may lead to diverging results. In addition, the results obtained in the different periods may also be associated with the stock market situation then.

Fama (1970) has defined the efficient market hypothesis whereby the market is said to be informatively efficient, if the stock prices reflect immediately and completely all available information. According to the efficient market hypothesis, investors are unable to take advantage of any information obtained from the market to earn abnormal returns. However the previous studies presented in this thesis as well as the empirical findings from the Finnish stock market show that it is possible to achieve abnormal returns around a company’s layoff announcement.

1.1. Purpose of the study

The purpose of this study is to find out does a final layoff announcement given in the Finnish stock market have an effect on stock prices. Especially the main point of view is to examine whether there are differences in stock market reactions between different industries and between different economical business cycles. The chosen industries - technology, manufacturing, and consumption goods and services - represent 78 percent of all the companies listed in the Nasdaq OMX Helsinki Stock Exchange when measured by daily trading volume. Two downturn and two upturn periods are derived from the investigation period of 2006–2011.

The previous studies' research results build a basis for this thesis and the findings are used as indicators of what to expect from the empirical part. The hypotheses are constructed based on the results from the previous studies made within the subject. Most of

the studies presented in this thesis investigated how layoff announcements impact stock returns in the U.S. market. This study utilizes Finnish data providing Finnish evidence about the stock price reactions caused by final layoff announcements.

Moreover, the realization concerning semi-strong form of market efficiency by Fama (1970) is observed. A final layoff announcement provides a new piece of information to the market and it should cause a positive or a negative price reaction depending on how investors interpret the content of the new information. In order for the semi-strong form to fulfill, the new piece of information should be adapted into the share prices without a delay. If abnormal returns occur after the announcement day, it implies that the market is inefficient. Consequently, abnormal returns before the event day indicate that the investors were maybe able to predict the date of the announcement or that there was an information leakage.

The first hypothesis is built in order to find out does a final layoff announcement cause a stock price reaction in the Finnish market. According to several studies (see, eg. Worrell, Davidson and Sharma 1991, Gunderson, Verma and Verma 1997, Chen, Mehrotra, Sivakumar and Yu 2001) layoff announcements have a negative impact on a company's share price. Due to the aforementioned empirical finding it is justifiable to assume that a final layoff announcement causes negative abnormal return. Based on this finding the first hypothesis is built and it tests whether a final layoff announcement causes a stock price reaction in the Finnish stock market.

H1: H_0: A final layoff announcement does not cause a stock price reaction.

H_1: A final layoff announcement causes a negative stock price reaction.

The second hypothesis is related to the stock price reaction and the difference in a market reaction's magnitude between companies operating in different industries. For example Worrell, Davidson and Sharma (1991) and Elayan, Swales, Maris and Scott (1998) have studied the differences in market reactions caused by layoff announcements across industries. However, their findings do not support each other. Elayan et al. found a significant difference in the market reaction whereas Worrell et al. did not find evidence for the matter. The approach to the subject was different as Elayan et al. focused on finding the differences between service-oriented companies and manufacturing companies where Worrell et al. studied the differences between eight industries.

This study focuses on finding differences in market reactions from three industries: technology, manufacturing, and consumption goods and services. These industries were chosen because they cover the majority (78 percent) of the total market share of all the listed companies in the OMX Helsinki stock exchange when measured by daily trading volume. Furthermore, both the technology industry and the consumption goods and services industry provide various services to customers. These two industries include service-oriented companies which relies strongly on human capital whereas the companies in the chosen manufacturing industry rely highly on physical capital. As the scientific approach industry-wise in this study simulates Elayan et al.'s (1998) division for companies operating in the service and manufacturing industry the second hypothesis is build with expectations to find differences in market reactions between chosen three industries.

H2: H_0: Stock price reactions caused by final layoff announcements do not differ between industries.

H_1: Stock price reactions caused by final layoff announcements are different between industries.

The third hypothesis is built in order to test whether the stock price reaction due to a final layoff announcement is affected by different economical situations. Previous studies (see, eg. Ursel and Armstrong-Stassen 1995 and Chatrath, Ramchander & Song 1995) indicate that different economical stages may have an impact on stock price reaction caused by a final layoff announcement. Elayan et al. (1998) found that a layoff announcement during downturn period is associated with a more negative market reaction compared to one during upturn period. Based on the finding made by Elayan et al. the last hypothesis is stated as follows:

H3: H_0: Stock price reactions caused by final layoff announcements do not differ between different business cycles.

H_1: Final layoff announcements given during economical downturn periods cause more negative stock price reactions compared to ones given during upturn periods.

1.2. Contribution of the study

The contribution of this study is to provide support for the previous studies that have researched share price reactions caused by layoff announcements. Most of the studies presented in this thesis are made with U.S. market data except for two with Canadian market data. This thesis provides evidence based on the Finnish data about the layoff announcements' effect on stock prices. This study focuses on comparing the market reaction's magnitude caused by a permanent layoff announcement across industries. Technology, manufacturing, and consumption goods and services industries are under observation. For example Worrell et al. (1991) and Elayan et al. (1998) studied the inter-industry differences. This study's approach to the subject retells the scientific approach used by Elayan et al. Moreover, this study tests whether different business cycles have an effect on how investors react to final layoff announcements. Ursel and Armstrong-Stassen (1995) and Chatrath et al. (1995) have stated that different economical situations may affect the market reaction caused by a layoff announcement. The investigation period of 2006–2011 includes two upturn periods and two downturn periods.

1.3. Structure of the study

This thesis is divided into six main chapters and it includes both theoretical and empirical parts. This thesis started with an introduction to the subject and it is followed by the second chapter which presents some of the previous studies made about the layoff announcements' effect on stock prices. The main research results are presented in order to build a basis for the empirical part. The third chapter introduces the basis of the financial markets. As well the efficient market hypothesis is covered and three deviations from the market efficiency are introduced. The empirical part of this thesis starts from the fourth chapter. It reviews the data and its classification used in the study and the event study methodology used to obtain the research results. The fifth chapter presents the empirical findings and it is finally followed by the conclusions.

2. PREVIOUS STUDIES

Previous studies show that the notice of termination has an impact on the company's stock price. This phenomenon is based on the fact that layoffs are considered as a kind of an indicator of the company's overall performance and financial situation. Nowadays corporate layoffs are very common but the subject has been under observation longer. The most significant studies concerning layoff announcements and their impact on company's performance were published in the 1990s. In this chapter previous studies and their main findings are presented in order to build a basis for this study.

2.1. Layoff announcements and market reaction

Worrell, Davidson and Sharma (1991) were the first ones to study financial and strategic aspects of layoff announcements. Their study was groundbreaking as there were no prior theoretical or empirical studies made about financial consequences of layoff announcements. In their study Worrell et al. investigated how corporate layoffs affect the U.S. securities market. The data consisted of 194 layoff announcements and they were divided based on the reasons given for the layoffs into two groups: layoffs due to financial distress and restructuring. Worrell et al. found statistically significant proof that the market response to layoff announcements is negative. The cited reason affected to the magnitude of the reaction. The reaction was stronger when layoffs were attributed to financial distress compared to restructuring. Also large and permanent layoffs caused a more negative market reaction compared to small and temporary layoffs.

Ursel and Armstrong-Stassen (1995) provide evidence about the market performance outside the U.S. market as they explored how shareholders react to layoff announcements in the Canadian stock market. The data sample consisted of 137 layoff announcements from 57 companies over the time period of January 1989 to August 1992. They found supporting evidence of layoff announcement's effect in the Canadian market as Worrell et al found from the U.S. which indicated that shareholders respond to a layoff announcement in their company negatively. Especially shareholders reacted more negatively to a company's initial layoff announcement compared to following layoff announcements. Ursel and Armstrong-Stassen's research results also support the findings of Worrell et al. (1991) regarding that shareholders found large-scale layoffs more negative than small-scale layoffs.

Gunderson, Verma and Verma (1997) examined layoff announcements' relation to companies' market values in the Canadian stock market over the time period of 1982–1989. The data sample consisted of 214 layoff announcements given by 84 companies. The results indicated that the market responded negatively to layoff announcements. The negative effect occurred almost always on the event day and the following day which implies that the market cannot predict the new information but it is still adapted quickly into the stock prices. It seemed that the market is capable of separating the bad news from the good news based on the information's content given in conjunction with the layoff announcement. The market reaction was positive in anticipatory layoffs such as in attempts to stabilize functions and negative in layoffs that signaled companies' fundamental difficulties such as inadequate demand or profits. The market response was more negative in layoffs that concerned the whole workforce related to partial layoffs. The market reaction was consistent for layoffs of definite and indefinite duration.

Like Worrell et al. also Palmon, Sun and Tang (1997) studied whether the cited reason in the layoff announcement affects the stock market reaction. They classified the layoffs into two categories: layoffs related to efficiency-enhancing and to declining demand. The data covered 140 layoff announcements, which occurred in the U.S. market through the years of 1982–1990. The researchers found out that the market reaction was negative for the companies who gave an employee notice because of weakening demand, while the reaction was positive for the companies who laid off employees due to improved efficiency. Another important finding was that there was a negative market reaction between the scale of layoff and stock return for the companies who cited the reason due to weakening demand.

Palmon et al. (1997) extended their research by studying the financial performance of the layoff announcing companies for three years before and three years after the layoff event. The results suggested that the cited reasons provide important information about how shareholders expect the announcement to reflect into companies' future profitability. It is unclear why companies state a declining demand as a reason when announcing layoff even though investors find it as a negative information regarding the companies' profitability. It may be due to the fact that management's reputation could suffer if they give misleading information about the layoff reasons.

Elayan, Swales, Maris and Scott (1998) claim that a market reaction caused by a layoff announcement may depend on the available information to shareholders and on the financial performance of the company. They had built two hypotheses based on the mar-

ket reaction to layoffs: the efficiency hypothesis and the declining investment opportunities hypothesis. In addition, they studied the layoffs' characteristics and their ability to increase the efficiency of the company and its labor force. Their research provided a broader evidence from the U.S. stock market as the data set consisted of 646 layoff announcements from 1979 to 1991.

Elayan et al. (1998) found similar results as Worrell et al. (1991) and Palmon et al. (1997). On average the market reaction to layoffs was significantly negative for the whole sample. Elayan et al. stated that the response may be negative because a layoff decision can be seen as a cause for weaker investment or growth opportunities, or less potential future cash flow development. For the declining investment opportunities hypothesis the results were consistent contrary to efficiency hypothesis. As for the increasing efficiency, layoffs did increase efficiency among labor force.

Chen, Mehrotra, Sivakumar and Yu (2001) studied the relationship between layoffs and shareholder wealth ratio, and the company's post-layoff performance. The study used a sample of 349 layoff announcements from the U.S. market covering the years 1990–1995. As for example Palmon et al. (1997) also Chen et al. (2001) found clear evidence that the stock market reacted negatively to the corporate announcement concerning layoffs.

Chen et al. (2001) broadened the classification of layoffs by dividing the announcements into four groups: layoffs attributed to cost cutting, demand decline, low prior earnings and restructuring. The researchers reported that the most significant negative market reaction was in companies who attributed layoffs to weak demand. This finding is consistent with the results obtained by Palmon et al. (1997). Layoffs due to restructuring caused no statistically significant reaction. The results also showed that layoff announcements were usually preceded by a period of poor stock market and profit performance. According to Chen et al. corporate layoffs are, however, a rational and reasoned decision, which aims to ensure the company's survival in the future.

Hahn and Reyes (2004) investigated stock market responses to layoff announcements that affected over 1000 employees. The limitation was made in order to involve only economically significant layoff announcements to the sample. Investigation period comprised of 78 layoffs that met the required limitation in the U.S. market between 1995 and 1999. Furthermore, Hahn and Reyes categorized the sample into layoffs attributed to low demand and restructuring. The researchers found that a stock market reac-

tion around a layoff announcement was negative to layoffs due to low demand. Contrary to prior studies (see Elayan et al. 1998 and Chen et al. 2001) they found that on the layoff announcement day the market responded significantly positively to layoffs due to restructuring. The difference in the results was due to different economic situations during the investigation period. Aubsiness cycle aspect to layoffs is discussed later in this chapter where the reasons for this difference are covered.

Farber and Hallock (2009) also examined if the share prices respond to the layoff announcements. Their study differs from the earlier researches presented in this thesis by its scale of the material. The data covered the years from 1970 to 1999 and it consisted of 4273 layoff announcements given by 1160 large U.S. companies. Farber and Hallock made several observations from their extensive material and discovered that the number of layoff announcements follow the business cycle quite closely. In addition, during the early years of the time period under observation stock price distribution was negative, but as the time period reaches its end share price changes are not as radical. One possible explanation is that as the decades go by the layoffs related to the company's efficiency improvements have become more general relative to the layoff announcements related to decreased demand.

The study also documented that the layoff announcements, which are given at the same time as other public notices, had a smaller absolute effect on the share price than a single layoff announcement. The cited reason in the layoff announcement, the industry, or an additional factor did not explain the change that occurred over the decades, during which the impact of the layoff announcement on the share price declined. (Farber & Hallock 2009.)

2.2. Layoff announcements between industries

The market reaction caused by a layoff announcement may depend upon the characteristics of the industry in which the company is operating as well as whether the company functions in manufacturing or service industry. A service-oriented companies, which rely strongly on human capital, face a more negative market reaction compared to other industries, which rely heavily on physical assets. (Elayan et al. 1998.)

In their study Elayan et al. (1998) found out that the market reaction was significantly different when comparing layoff announcements across industry types. The results

pointed out that layoff announcements by companies operating in the manufacturing industry cause a smaller market reaction relative to layoffs in banking and other financial institution companies. It can be concluded that service-oriented companies are more vulnerable to a change in human capital than manufacturing companies. Industry differences were also studied by Worrell et al. (1991) who tried to find differences in eight industries: aerospace, electronics, petroleum, banking, steel/metal, telecommunications, media, and transportation. Statistically significant differences in share price reactions caused by a layoff announcement between chosen industries were not found.

Ranganathan & Samant (2006) noted that there is a lack of studies that try to explain the reasons for massive number of IT personnel layoff announcements even though there is an increasing industry concern over the matter. The researchers studied the trends in 569 information technology layoffs given by 417 companies in the U.S. market for two years 2000 and 2001. Their descriptive study revealed that the most common reasons for announcing layoffs were a need for cost cutting and to enhance productivity as well as restructuring. The financial environment of companies downsizing IT employees was good and even on the increase but they had severe problems in cost controlling as they performed worse cost-wise than their competitors.

Goins and Gruca (2008) stated that a company's reputation among employees and investors suffer when the company announces a significant permanent layoff. Goins and Gruca examined how one company's layoff announcement affects the reputation of other companies operating in the same industry. The study reviewed 71 layoff announcements given by 30 companies operating in the U.S. oil and gas industry during years 1989–1996. Share price changes of rival companies were used as an indicator to interpret how a layoff announcement given by one company within the same industry reflects to competitors' reputation.

The result were in line with the most of the presented layoff announcement studies as it showed that the mean reaction caused by a company's layoff announcement was somewhat negative but not in this case statistically significant. According to the findings, one company announcing a layoff did have an impact on rival companies in the industry. If the market reaction for the announcing company was negative, it was also seen as bad news for the whole industry. A positive reaction, on the other hand, for the company announcing the layoff was considered as positive information for the other companies as well. In addition, as the layoffs became a widely recognized phenomenon within the industry, the greater the negative reaction among other companies operating in the same

industry was. However, the close competitors were not exposed to such great negative impact as the layoff announcing company did. (Goins & Gruca 2008.)

Cagle, Sen and Pawlukiewicz (2009) claimed that there are few studies made about the layoff announcements by financial institutions and yet most of those studies limit the sample of financial institutions to cover only banks. In their study Cagle et al. took into account the layoff announcements given by banks and non-bank financial institutions which are bank holding companies, security brokers and dealers, non-bank financial holding companies, mortgage banks, non-bank depository institutions, insurers, and other non-depository institutions not classified elsewhere.

Cagle et al. (2009) examined inter-industry differences in market reactions caused by layoff announcements. The data consists of all layoff announcements made by financial institutions covering the time period from 1994 to 2003. Cagle et al. found out that banks cause a more positive stock price reaction than other types of regulated companies. They concluded that the results prove that bank regulation reduces asymmetric information surrounding layoff announcements to a greater extent than the regulation of other types of financial institutions.

2.3. Layoff announcements during business cycles

Layoffs and their causes are assumed to be a function of the business cycle. During the recession when economic activities have contracted companies lay off their employees in expectation of lower earnings and bad performance. Instead during the economic boom period companies' layoff announcements can be seen as an effort to increase company's efficiency. However, it is anticipated that market reaction to layoffs is more negative during the recession than during the boom period. (Elayan et al. 1998.)

Elayan et al. (1998) found support for their hypothesis concerning the difference in market reaction during different economical situations. A more negative market reaction was caused when a company announced a layoff during the recessionary period compared to an announcement given during the boom period.

Chatrath, Ramchander & Song (1995) studied whether the market reacts differently to layoff announcements given during different business cycles. They noted that apart from firm-specific factors the general economical environment may affect investors'

reaction to layoff announcements. Layoffs during upturn periods were easily seen as an indicator that the company is in difficulties whereas the reasons for layoffs during downturn periods were seen as an aim to reorganize the company. The investigation period ranging from 1981 to 1992 included one upturn period that took place in 1984–1990 and two downturn periods that occurred in 1981–83 and 1991–1992. The data contained 231 U.S. corporate layoff announcements from which 56 were given during upturn period and 175 during downturn periods. According to the results, there was a significantly negative market reaction during the recessionary period in the early 1980s, and during the upturn period of 1984–1990. However, stock price reaction to layoffs given in the 1990s was significantly positive. These differences in reactions may indicate structural changes in the U.S. labor market in the early 1990s. (Chatrath et al. 1995.)

Ursel and Armstrong-Stassen (1995), whose main research results were covered earlier in this chapter, claimed that there may be a difference in shareholders' reactions to layoff announcements during recessionary and non-recessionary periods. They predicted that layoff announcements given during downturn periods were seen positively as a sign that companies are trying to reduce costs. Layoffs in upturn periods instead may indicate that the company is in grave difficulty.

As reviewed previously in this chapter Hahn and Reyes (2004) discovered positive stock market reaction for layoffs that were attributed to restructuring. This finding differs from the earlier studies' results (see Elayan et al. 1998 and Chen et al. 2001) where layoffs due to restructuring did not cause statistically significant market reaction. Hahn and Reyes supposed that the difference between the restructuring results was gained because of the different investigation period choice. For example Chen et al. (2001) used years 1990–1995 in their study when the upturn period was in the early stage whereas Hahn and Reyes used years 1995–1999 when the expansion was more strong. Investors' pessimism during downturn periods and optimism during upturn periods causes different expectations and responses to layoff announcements. Pessimism may lead to a more negative reaction during downturn period whereas during upturn period optimism may lead to a more favorable reaction. (Hahn & Reyes 2004.)

3. FINANCIAL MARKET EFFICIENCY AND PERFORMANCE

According to Malkamäki (1989: 28), the main purpose of the financial markets is to efficiently direct the funds of the surplus sector as a commitment of equity and liability to the ones who have the need for the money i.e. the deficit sector. Financial markets are divided into two groups depending on the duration of the loan; short-term and long-term markets. A loan period lasting less than a year is considered short-term financing whereas a loan period continuing over a year is defined as long-term financing. Short-term financing is transmitted at the money market and the credit market, while long-term financing in turn is conveyed at the capital market. The money and the capital markets can also be divided according to whether the instrument is suitable for secondary market or not. Typical example of an instrument is a loan given by a bank in which the promissory note is once purchased and after that it does not have liquid secondary market. Money market instruments, bonds and shares, however, are securities which investors can trade for example in the money market and stock exchange. (Schwartz 1988: 11–12.)

When examining the perfection of the functioning of financial markets it often concerns the long term financial markets i.e. capital markets. For perfect capital markets Copeland and Weston (1988: 330) set the following four conditions:

1. Markets are smooth meaning there are no transaction costs or taxes on the market and all assets are fully distributable and for sale. Also there are no other restricting rules in the market.
2. Commodities and securities markets are perfectly competitive. At the commodity market it means that all producers offer their products and services at the minimum cost. As for security markets all the participants trade at market prices.
3. Markets are informatively efficient; information is free and available simultaneously to all market participants.
4. Individuals are all rational trying to maximize their own expected utility.

If financial markets meet the conditions listed, they are said to be allocatively and operationally efficient. Operational efficiency deals with the transaction costs of assets as in the operationally efficient market transaction costs are assumed to be zero. In the allocatively efficient market all the relevant information at the market reflects directly and

without delay in the prices of investment assets as the savings are directed optimally to productive investments. (Copeland & Weston 1988: 330–331.)

According to Malkamäki (1989: 31), in reality, however, financial markets are not perfect but the existence of the theoretical framework has made it easier to research the field. Capital markets can perform effectively even though they do not fulfill all the assumptions of a perfect market.

In the beginning of this chapter, basis of the capital markets and the conditions of the perfect market were presented. Next the role of new information in the financial markets is examined after which the efficient market hypothesis is introduced. Fama's (1970) definition of the three forms of market efficiency is presented. In addition, two stock valuation models are introduced.

3.1 The effect of new information in the financial markets

In the financial market prices only change as new, relevant information comes to the market. However, in the efficient market share prices behave completely randomly meaning that the probability of price rise one day is equal to the probability that it falls. Thus the share prices change regardless of past performance. (Blake 2000: 392; Nikkinen, Rothovius & Sahlström 2002: 80–82.) Maurice Kendall (1953) was the first one to notice that no predictable pattern in stock prices could be identified. Kendall proposed a theory of *random walk* in which stock prices seemed to evolve fully coincidentally.

At first Kendall's results were interpreted as an implication of stock market irrationality. Soon, however, economists realized that random stock price movements are an indicator of a well-functioning market. If prices are to reflect all available information, price changes must appear only in response to new information. According to the definition of new information, price change must be unpredictable; if it could be predicted, then the prediction would be part of today's information. Thus stock prices that change in consequence of new information also must move unpredictably. This is the essence of Kendall's conclusion that the prices of stocks should follow a random walk. (Bodie, Kane & Marcus 2009: 344–345.)

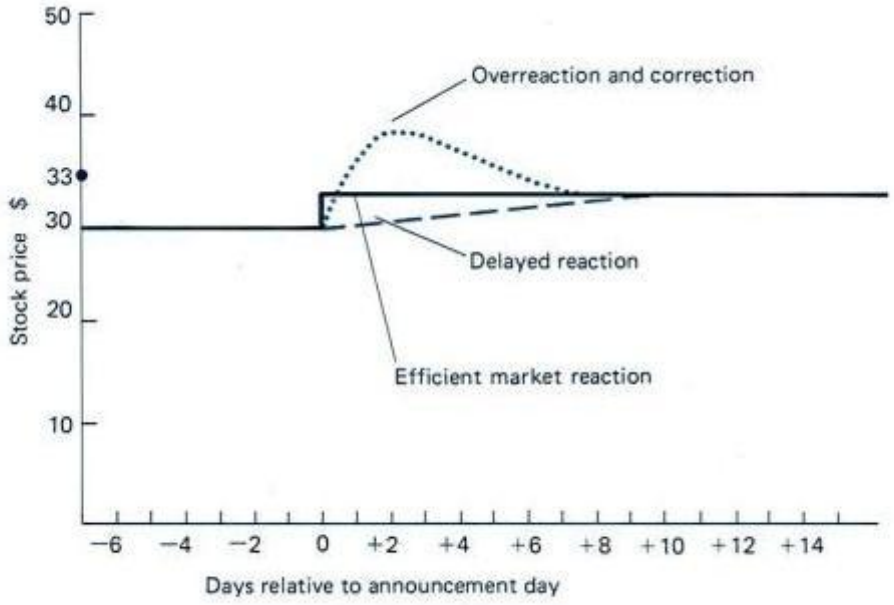

Figure 2. Stock price reaction to new information in an efficient and inefficient market. (Haugen 1993: 643)

In order for the financial markets to be efficient, security prices should react immediately to the new information as it is received. Market prices' reaction should also be unbiased. The primary reaction should reflect exactly the true implications of the information on the value of the security without a need for later correction. There are three possible scenario presented in the figure 2 about how stock market price may react to a new piece of information. Consider positive information which is released on the day 0 and a $3 increase on the value of the stock is expected. The solid line represents a stock reaction in an efficient market. The new piece of information is directly adopted into the price of the stock without further corrections. The broken line demonstrates a possible stock reaction in an inefficient market where market participants react slowly to the new information. Only a few investors initiate trading the stock in the first day which leads to a small increase in the price. After a lag of one or more days, brokers inform their clients that the current price of the stock is undervalued driving the price up to its new intrinsic value. The dotted line depicts another scenario in an efficient market where some investors who are over optimistic about the consequence of the information's impact on the value of the stock either get the information first or are prepared to act on it. These investors believe that the intrinsic value of the stock is more than $33, and their buying activity cause to drive the stock price above that level. Eventually the price falls

back to its correct level as other investors begin to sell their stock. (Haugen 1993: 642–643.)

If the market functions truly efficiently, neither the broken line nor dotted line scenarios should be possible in the real market (Haugen 1993: 643). Considering a layoff announcement given by a company it is a new piece of information in the financial market. Previous studies show that markets do react to layoff announcements either positively or negatively for example depending on the reason given. Later empirical studies show how stock prices react to the release of a final layoff announcement in the Finnish stock market and whether there are differences in the market reactions across industries and business cycles.

3.2 Efficient market hypothesis

Eugene Fama (1970) has developed *the efficient market hypothesis* (later EMH) according to which markets are said to be informatively efficient if all information available in the market and all information significant to determine the stock price are reflected immediately and perfectly to the stock prices. Therefore EMH implies that not one of the market participants can take an advantage of any information available in their own investments to earn abnormal returns. (Nikkinen et al. 2002: 82.) However, financial market efficiency has interested researchers and there are several piece of evidence that markets are not completely efficient. Anomalies or deviations from the market efficiency are a proof that there is a possibility to earn abnormal returns in the financial market.

EMH relative to the stock market can be divided into different levels depending on the quality of information under observation. Fama (1970) defined three forms of market efficiency as follows:

1. In markets that fulfill the conditions of the *weak form* of market efficiency security prices reflect only all the information contained in the development of past prices which include price changes, trading volume and other market information.
2. In the second level, the *semi-weak form* of market efficiency, all new published information is immediately included into the security prices. Public information contains both all the information featured in the weak form of efficiency and for example shares profits and economy and politics news.

3. According to the *strong form* of market efficiency all the information including both published and unpublished information is reflected in security prices.

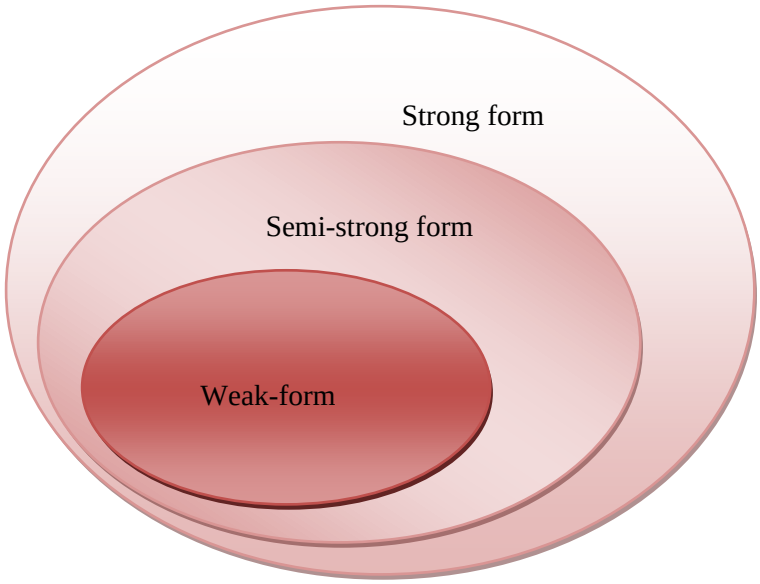

Figure 3. Three forms of market efficiency.

Information efficiency, in the context of the weak form of market efficiency, means that there should be no correlation between past price changes and future price development because changes in the prices are independent of each other. As for in the case of the weak form market efficiency implies that as trading regulations are based on the past development of prices it is not possible to achieve net returns above average. (Reilly 1989: 214.) Thus technical analysis, which examines the actual prices of the shares in order to find certain regularity, when used alone does not produce larger net income than normally (Nikkinen et al. 2002: 83).

According to the semi-strong form of market efficiency, share prices include along with conditions of the weak form all the public information such as dividends, the published financial statement, new products and profit forecast (Blake 2000: 392). As the conditions of the semi-strong form are met all new information relevant to the pricing of the securities is adopted immediately into the security prices. Thus positive news lead to an increase in the price and negative news are reflected in the market as a decrease in the

price. (Malkamäki 1989: 37.) When the markets are efficient stock price reactions show unambiguously the meaning of the published information. Fundamental analysis helps to interpret the conditions of the semi-strong form. The aim in the fundamental analysis is to determine the present value of the future cash flow of a stock. In practice the analysis attempts to calculate the share price exploiting company's equities and profit prospects as well as forecasting the risk and interest level. (Nikkinen et al. 2002: 83.) The most challenging part of the fundamental analysis is to find companies that perform better than everyone else estimates (Bodie et al. 2009: 351).

As presented in the figure 3 above markets that fulfill the conditions of the strong form comprehend both the weak form and the semi-strong form as well as all the companies' unpublished information i.e. monopolistic information. Naturally, it would be possible for insiders to earn superior profits by trading their own firm's stock. Therefore it is fundamentally restricted by security market's law. The strong form also covers the assumptions of the efficient market and the perfect market in which all information is available simultaneously to all market participants. However, economists have not been able to prove the realization of the strong form's conditions in any financial market. (Reilly 1989: 215; Nikkinen et al. 2002: 83–84.)

3.3 Stock valuation

The expectations of a company's future cash flows are reflected in the share price. If the cash flow expectations increase, the share price rises whereas the corresponding reduction in cash flow expectations lead to a decrease in the share price. Factors that are independent of a company may also have a distinct impact on the share price such as inflation, the overall situation in interests and exchange rate changes. All the factors mentioned reflect immediately into the prices of shares as the market is efficient. (Martikainen 1995: 84–85.)

3.3.1 The capital asset pricing model

The Capital Asset Pricing Model (later CAPM) is a model that is used to define the yield requirement of a share. According to the CAPM, stock returns should be determined on the basis of a systematic risk i.e. beta coefficient and a risk-free rate of return. Sharpe (1964), Lintner (1965) and Mossin (1966) are considered as the developers of

the model. They based the CAPM on the modern portfolio theory introduced by Markowitz (1952).

As mentioned before the CAPM states that the expected risk premium on each investment is proportional to its systematic risk. A share's beta factor describes the response of the share's returns to changes in the rates of return to the market portfolio which consists of all risky investments in the financial market. According to equation 1, beta coefficient is achieved by dividing the covariance between a share's return and the market portfolio return by the variance of the market portfolio (Bodie et al. 2009: 113, 281.):

(1) $$\beta_i = Cov\,(r_i\,, r_m) \,/\, \sigma_m^2$$

where r_i = rate of return of share i
r_m = rate of return of the market portfolio

The CAPM determines the yield of the investment as follows (Knüpfer & Puttonen 2009: 148):

(2) $$E(r_i) = r_f + \beta_i[E(r_m) - r_f]$$

where $E(r_i)$ = expected return on share i
r_f = risk-free interest rate
β_i = systematic risk on share i
$E(r_m)$ = expected return of the market portfolio

As it is seen from the equation 2 the share's yield is composed of two parts. The first part consists of a risk free interest rate and the second part is the risk premium of a share. The CAPM also provides an equation known as the security market line that represents the relationship between expected return and market risk. According to the CAPM, each stock should lie on the security market line because the highest returns on the specific risk level are earned on the line which concludes that the stocks are correctly priced. (Brealey, Myers & Allen 2006: 189.) Figure 4 illustrates the correlation between the risk of a stock and its expected rate of return.

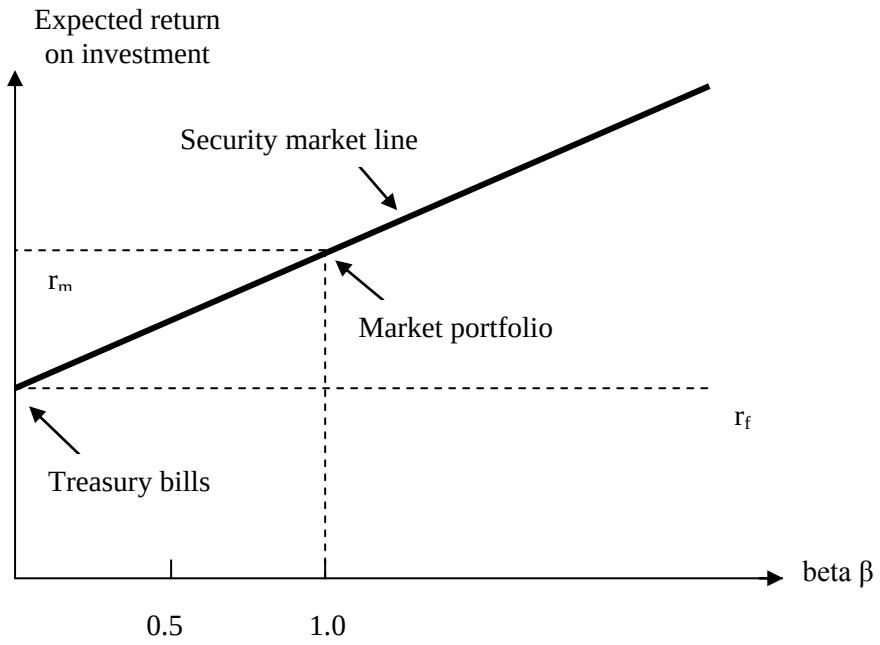

Figure 4. The security market line. (Brealey & Myers 2003: 195)

3.3.2 The arbitrage pricing theory

While CAPM analyzes how investors construct efficient portfolios (1976), *the Arbitrage Pricing Theory* (later APT) developed by Stephen Ross approaches the subject from a different point of view. The APT is another commonly used equilibrium model which assumes that the return of every individual stock depends on more than one risk factor. (Brealey ym. 2006: 189.) According to the APT the expected return of a stock can be calculated as follows (Copeland & Weston 1988: 219):

(3) $$\tilde{R}_i = E(\tilde{R}_i) + b_{i1}\tilde{F}_1 + \ldots + b_{ik}\tilde{F}_k + \tilde{\varepsilon}_i$$

where $\tilde{R}_i$ = return on share i
$E(\tilde{R}_i)$ = expected return on share i
b_{ik} = sensitivity of share i return to factor k
$\tilde{F}_k$ = value of factor k
$\tilde{\varepsilon}_i$ = Unsystematic return on share i

Equation 3 shows that the APT assumes that share's return depends on two parts. The first part consists of macroeconomic factors and the second from events that are unique to every company. Unlike the CAPM which expects that share's return depends only on

its beta coefficient, APT believes that expected return of the share is dependent on a several different risk factors to whom also have to define its own beta coefficient. (Copeland & Weston 1988: 219–220.)

There are two kinds of risk for any individual share. First is the risk caused by the macroeconomic factors that cannot be eliminated by diversification. Another risk arises from possible events that are unique to all companies. However, unique risk can be eliminated by diversification. Share's expected risk premium is only affected by macroeconomic factors. The APT claims that the expected risk premium on a share depends on the risk premium associated with each factor and sensitivity of a share to each of the factors b_1, b_2, … b_k. Share's expected risk premium π is gained as follows (Brealey & Myers 2003: 205.):

(4) $$\pi = r - r_f$$
$$= b_1(r_{factor\,1} - r_f) + b_2(r_{factor\,2} - r_f) + \ldots$$

The arbitrage applies to well-diversified portfolios, where the unique risk has been eliminated by diversification. If the arbitrage pricing relation holds for all diversified portfolios, it must hold as well for the individual shares. Therefore each share has to offer an expected return commensurate with its contribution to portfolio risk. According to the APT this contribution, in turn, depends on the sensitivity of the return of the share to unexpected changes in the macroeconomic factors. (Brealey & Myers 2003: 205.)

4. DATA AND METHODOLOGY

This chapter represents the data and the methodology used in this study. Event study is a common method used in the field of finance and this research methodology will also be used to obtain the empirical results in this study. Event study examines how a specific event impacts a share's value on a specific point in time.

4.1. Data description

Data used in this study consists of 257 layoff announcements for permanent layoffs given in Finland from the beginning of January 2006 until the end of December 2011. Research material is comprised of all the companies announcing layoffs within the investigation period and operating in one of the chosen industries (technology, manufacturing, and consumption goods and services) as well as are listed in the Nasdaq OMX Helsinki Stock Exchange. A criterion is that a company's daily trading volume has to be greater than 10 000 000 Euros for the whole investigation period. Limitation was made in order to eliminate the effect of low traded stocks. In addition, if a company has more than one series of shares in the market the more liquid share -i.e. the one with greater trading volume- is taken into account when calculating daily logarithmic returns. All the stocks used in this study are listed in appendix 1.

Companies' announcements regarding the layoffs are gathered from Kauppalehti Online database, Taloussanomat Online and Nasdaq OMX Helsinki Stock Exchange. The total numbers of the layoff announcements are taken from the statistics of SAK (Suomen Ammattiliittojen Keskusjärjestö). The daily stock market data and volumes were provided by the department of Accounting and Finance in University of Vaasa. In this study daily logarithmic returns are used for stocks and index. Daily logarithmic returns for stocks are calculated as follows (Vaihekoski 2004: 194):

(5) $$R_{it} = ln\left(\frac{P_{it}}{P_{it-1}}\right)$$

where R_{it} = logarithmic return for share i
P_{it} = closing value for day t for share i
P_{it-1} = closing value for share i preceding day t

Daily logarithmic returns for OMX Helsinki Cap index are also obtained utilizing equation 5. In order to define normal and abnormal returns OMX Helsinki CAP portfolio index is used as a market return. OMX Helsinki CAP index is a market value weighted index in which the maximum weight for a single stock is limited to ten percent. Overall OMX Helsinki CAP index is considered better indicator of a market return than OMX Helsinki general index because it includes same equities as OMX Helsinki index but is value weighted. (Vaihekoski 2004: 208–209.)

This study focuses on three major industries announcing layoffs in the Finnish stock market: technology, manufacturing, and consumption goods and services. These three industries represent 78 percent of all the listed companies when measured by daily trading volume. Technology covers 47 percent, manufacturing covers 27 percent, and consumption goods and services covers 4 percent of total market share. As said, the data sample consists of 257 layoff announcements given by 66 companies. In this study the companies are first divided into three portfolios according to which of the three industries they operate in. The layoff announcements are split between the industries in such a way that 146 of them were given in the manufacturing industry, 70 in the consumption goods and services industry, and the rest 41 of the layoffs in the technology industry. Figure 5 illustrates how the final layoff announcements are divided between the chosen industries and years under observation.

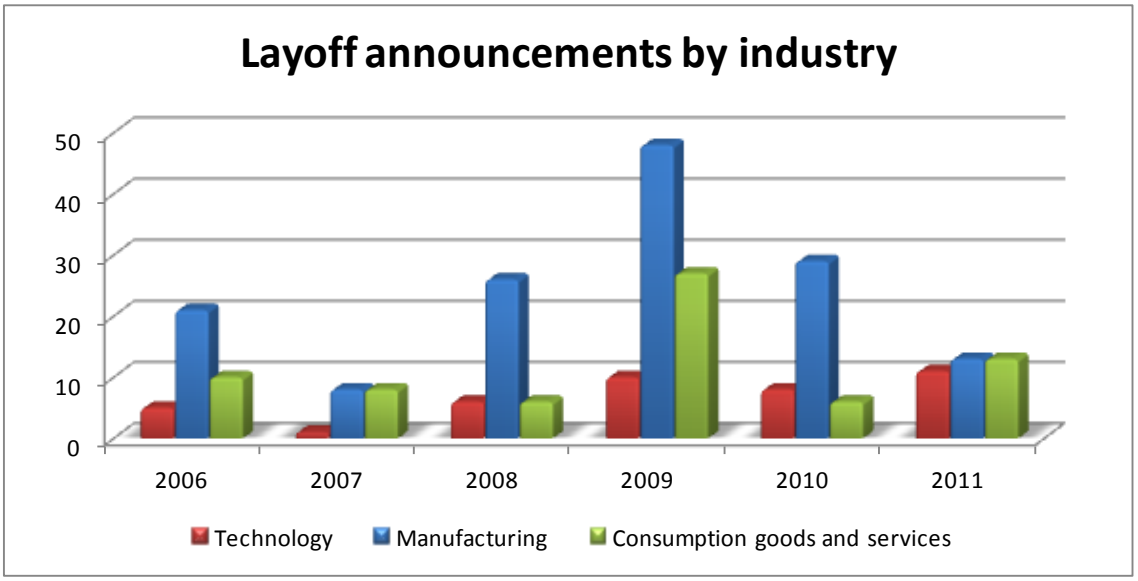

Figure 5. Layoff announcements by industry during investigation period.

Once the division between industries is done, the companies that have given layoff announcements during the investigation period are also divided into portfolios according to the business cycle. These two splits support the hypotheses introduced in the first chapter of this thesis. Figure 6 illustrates how the final layoff announcements are divided between industries and different business cycles. As it can be seen, there are more final layoffs given during upturn periods than during downturn periods. The majority of the layoff announcements are also given in the manufacturing industry.

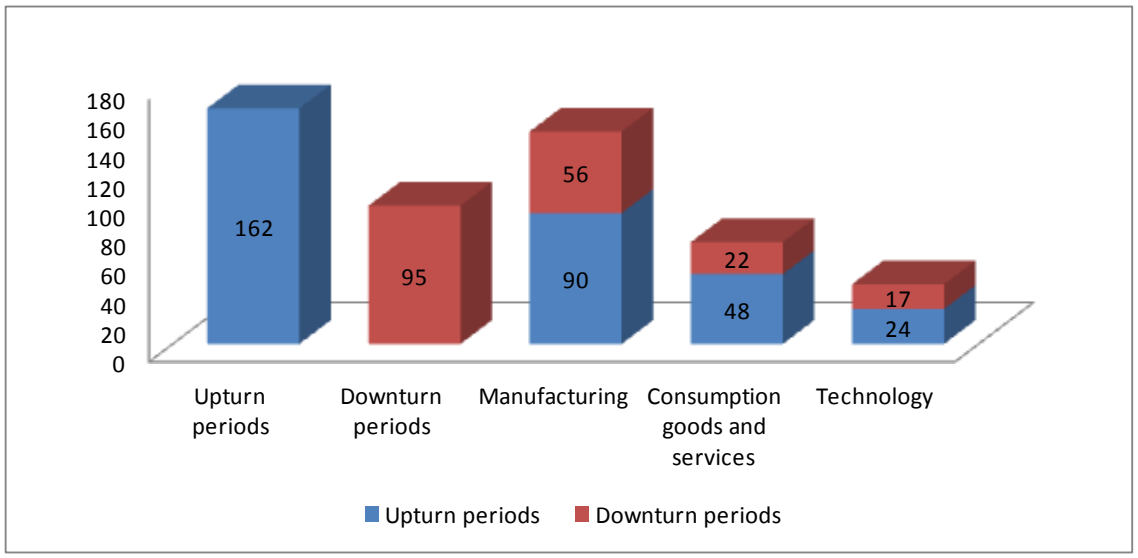

Figure 6. Layoff announcements' split to upturn and downturn periods.

In order to be able to generalize the results statistically it is required that there are enough observations (at least 30) from the chosen event. Generally it is considered to be desirable to have a sample of one hundred events. It is to be noted that there is a limited number of observations within technology industry when the split to business cycle portfolios are done. When using Finnish data as a research material it is in some cases inevitable that there are not as many observations as required and this is considered as a limitation in this study. (Vaihekoski 2004: 230, 237.)

4.2. Event study methodology

As mentioned earlier, when share prices reflect all currently available information, then new information in the market has to cause price changes. Therefore, the importance of

an event should be measured by investigating price changes during the time period in which the event occurs. An *event study* methodology enables to examine the impact of a specific event on a company's share price. (Bodie et al. 2009: 353–534.)

Normally an event study starts with a proxy for what stock returns would have been without the published event -that is a definition of the normal return or the expected return. The abnormal return caused by the event is evaluated as the difference between the actual return of a share and the return expected considering the performance of the market. (Bodie et al. 2009: 354.)

As far as it is known, the first published research which utilized event study methodology was James Dolley's (1933) study about the price effects of stock splits. For the following 30 years starting from the early 1930s the knowledge of the event study grew and it was developed. In the late 1960s Ball and Brown (1968) and Fama, Fisher, Jensen and Roll (1969) introduced their groundbreaking methodology that is fundamentally the same as the one in use nowadays. (MacKinlay 1997: 13–14.)

4.2.1. The six phases of event study

There is no certain structure for the event study because several researchers have formed instructions about how to carry out an event study. However, the course of events are similar in the models. MacKinlay (1997) suggests the following structure of the event study:

1. Defining the event and the event window
2. Defining the criteria for selection of companies
3. Defining the calculation method of the abnormal return
4. Defining normal returns and estimation window
5. Testing the statistical significance of the abnormal returns
6. Presenting the empirical results

Event study starts off with defining an event of interest and choosing a time period surrounding the event over which the changes in share prices are observed. The event window can only include the announcement day of the event but it usually includes several days before and after the event. Wider event window enables a researcher to examine possible share price changes also surrounding the event. (MacKinlay 1997: 14–15.) In this study the event of interest is a company's final layoff announcement. The exact

event day (0) is a day when the company announces the final layoff. The development of the stock return is observed for eleven days starting four days before the announcement and ending six days after. Figure 7 illustrates the time line of this study.

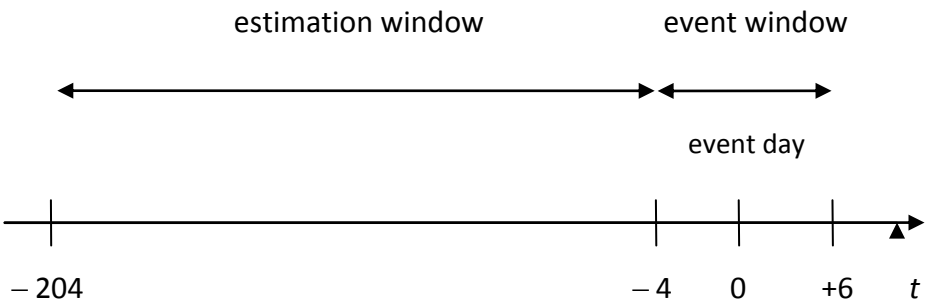

Figure 7. Time line used in this study.

After the first phase, the selection criteria needs to be defined. The choice of what companies to include in the data and on what grounds has to be done. The restrictions for the data can be made by including companies that are listed in a specific stock exchange or have a certain characteristics (MacKinlay 1997: 15). This study utilizes Finnish stock data for years 2006–2011. Companies listed in the Nasdaq OMX Helsinki Stock Exchange are included providing that the company announces layoff during the investigation period, operates in technology, manufacturing, or consumption goods and services industry, and has daily trading volume greater than 10 000 000 Euros for the whole investigation period. These three limitations are used in order to obtain the final data.

In the third phase the calculation method for the abnormal return has to be chosen. The normal return is defined as the expected return when the event under observation does not take a place in the market. The abnormal return is obtained by deducting the normal return from the actual return. Mathematically the abnormal return is defined as follows (MacKinlay 1997: 15):

$$(6) \qquad AR_{it} = R_{it} - E(R_{it})$$

where AR_{it} = abnormal return for share i for period of time t
R_{it} = actual return for share i for period of time t
$E(R_{it})$ = normal return for share i for period of time t

The fourth step in the event study is to determine normal returns and estimation window. The estimation window is utilized when defining share's normal return and its parameters. Usually the estimation window covers 200–250 days prior to the event day. The event window itself is not normally included into the estimation window in order to avoid the event from affecting the results. (MacKinlay 1997: 15.) In this study the estimation window covers 200 days starting 204 days prior to the event day and ending 4 days before the announcement day, and the market model is used for calculating the normal return. The ways to define normal and abnormal returns are taken into closer examination in the next subtitle.

Once the normal returns and estimation window have been defined, the abnormal returns can be calculated and then the statistical significance of the abnormal return needs to be tested. In this part it is important to specify the hypotheses and to choose a method for aggregating the abnormal returns for all companies (MacKinlay 1997: 15). The statistical significance can be tested with a two sided t-test which will be presented later in this chapter. Finally, the last part in the event study is to present the empirical results and discuss about the findings.

4.2.2. Defining expected and abnormal returns

There are several models available to define the normal return of a share. The models can be divided into two categories: economic and statistical models. The economical models are not only based on statistical assumptions but also utilize assumptions concerning investors' behavior whereas statistical models rely solely on statistical assumptions. Two common economic models are CAP-model and APT-model that are presented in the previous chapter. The presented statistical models in this study are *the mean-adjusted return model* and *the market model.* The statistical models are nowadays generally used in the event studies because biases observed with economic models can be eliminated by using the statistical models. (MacKinlay 1997: 17–19.)

In the mean-adjusted return model the mean return of a share is assumed to be constant through time. In this model, the mean return is the expected return of a share and it is obtained by calculating the mean of share's actual daily returns from the estimation period. The abnormal return using mean-adjusted return model can be calculated with the following equation (MacKinlay 1997: 15, 17.):

(7) $AR_{it} = R_{it} - X_i$

where X_i = the expected mean-adjusted return for share i

Even though the mean-adjusted return model is the simplest model for calculating the normal return, Brown and Warner (1980, 1985) claimed that the results did not usually differ significantly from the results yielded by using more sophisticated models. The reason is that the variance of the abnormal return is frequently not reduced a lot by using more complex model. (MacKinlay 1997: 17.)

In this study the market model is used to obtain normal returns for all stocks. The market model is commonly used for estimation of abnormal returns. The market model relies on the assumption that there is a stable linear relation between the stock return and the market return. The linear specification of the model is based on the presumption that stock returns are normally distributed. The normal return in the market model is obtained as follows (MacKinlay 1997: 15, 18.):

(8) $R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$

where R_{it} = the normal return for share i during a given period of time t
α_i and β_i = parameters of the market model
R_{mt} = market portfolio's return during a given period of time t
ε_{it} = the zero mean disturbance term

When $E(\varepsilon_{it} = 0)$ and $var(\varepsilon_{it}) = \sigma^2_{\varepsilon i}$, the market model can be shown as:

(9) $R_{it} = \alpha_i + \beta_i R_{mt}$

Compared to the mean-adjusted return model the market model includes an improvement to the calculation of the normal return. The variance of the abnormal return is reduced as the part of the return that is related to variation in the market's return is removed. As it can be seen from the equation 9, the market model is a one factor model. The parameters α and β in the market model are estimated using ordinary least squares (later OLS) regression. Once the OLS estimators for the estimation window are obtained, the normal return and further the abnormal return for a share can be calculated (MacKinlay 1997: 18, 20.):

(10) $AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt}$

In this study the estimation window starts 204 days before the event day and ends before the event window begins in order to avoid overlapping of the estimation window and the event window. OMX Helsinki CAP index is used as a market return. The reasons for the choice of the market return are presented in the data description. The intercept α and the slope coefficient β needed in the market model are achieved using OLS regression. The regression analysis is made with Microsoft Excel's Data Analysis Tool.

Once the abnormal returns are calculated for all stocks using equation 10, the average abnormal return for each event window day can be calculated (Vaihekoski 2004: 232). Thus in this study the daily average abnormal returns are calculated for 11 day observation period [-4,+6] as follows (MacKinlay 1997: 24):

(11) $AR_t = \frac{1}{N} \sum_{i=1}^{N} A\,R_{it}$,

where, N = the number of observations

AR_t = the sample average of the *N* abnormal returns

AR_{it} = the abnormal return for share i during time t

Apart from calculating the daily abnormal returns, it is also meaningful to observe how returns act on a specific period. The abnormal return observations have to be aggregated in order to obtain cumulative abnormal returns. (Vaihekoski 2004: 233.) The cumulative abnormal return is a sum of the abnormal returns for an event window as follows (MacKinlay 1997: 24):

(12) $CAR(t_1,t_2) = \sum_{t=t1}^{t2} A\,R_{it}$

where, $CAR(t_1,t_2)$ = the cumulative abnormal return for an interval t_1,t_2

4.2.3. Testing the statistical significance of abnormal returns

Heikkilä (2008) suggest that testing the statistical significance consists of six phases and starts with placing the hypotheses and collecting the sample. As they are done the testing proceeds by choosing the statistical test and performing the test. Once the results are obtained it is time to interpret the results and finally make the conclusions about them.

Before the researcher can generalize the results across the population, it is needed to confirm that the probability of the chance between the variables' dependence or difference between groups is small enough. The dependence or the difference has to be statistically significant. The most commonly used significance levels are 0.1 (10 %), 0.05 (5 %), 0.01 (1 %) and 0.001 (0,1 %) which are also used in this study. The smaller the significance level, the more significant the result. (Heikkilä 2008: 190, 194–195.)

In this study, t-test is used for testing the statistical significance of the abnormal returns. The statistical significance of both the daily average abnormal returns and the cumulative abnormal returns are researched. The t-test measures whether the abnormal returns differ from their expectation value that is zero in this study. The two-tailed t-test is used in this study because the abnormal returns can be either positive or negative (Heikkilä 2008: 198.):

(13) $$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$$

where, $\bar{x}$ = the sample mean
μ_0 = the expectation value
s = the standard deviation of the sample
n = the amount of observation

The standard deviation of the sample is calculated as follows (Heikkilä 2008: 86):

(14) $$s = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{\sum x_i^2 - \frac{(\sum x_i)^2}{n}}{n-1}}$$

As explained in the data description (see chapter 4.1.) the observations are divided into different portfolios based on the hypotheses of this study. The daily average abnormal returns and the cumulative average abnormal returns are calculated separately to each portfolio. Additionally, the returns between different portfolios are compared. The t-test can be used to test the means of two independent groups. The condition is that the variables are normally distributed which means that the abnormal returns under observa-

tion are assumed to be normally distributed. The t-test for two independent samples can be calculated with equation 15 (Heikkilä 2008: 230, 314):

(15) $$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

5. EMPIRICAL FINDINGS

In this chapter the empirical findings regarding permanent layoff announcements' impact on stock prices are presented and discussed. First the average abnormal returns caused by permanent layoff announcements for the whole sample are presented. The second part focuses on inter-industry differences. The sample of 257 layoff announcements is divided into subsamples based on in which of the three chosen industries the company operates. Finally, the last part consists of the results about how the market reacts to layoff announcements given during different business cycles. Furthermore, the differences in average abnormal returns between upturn and downturn periods are discussed. The results are achieved by using the models that are presented in the previous chapter. All average abnormal returns are calculated on daily basis, cumulatively and in intervals.

5.1. Whole sample

Table 1 shows the average abnormal returns caused by a permanent layoff announcement for the whole sample covering the years 2006–2011 and including 257 observations. According to the results, permanent layoff announcements do not cause statistically significant abnormal returns within the event window. P-statistics indicate that the returns are not significantly different from zero either around the announcement or at the announcement day. Cumulative abnormal returns are mainly positive but quite non-existent.

As there are no statistically significant abnormal returns around the event day it seems that the Finnish stock market is efficient and new information is adapted effectively to the stock price. However, in order for the semi-strong form of market efficiency to be fulfilled a new piece of information - in this case a company's final layoff announcement - should be reflected into the share price on the announcement day causing either positive or negative abnormal return. The abnormal return on the event day is -0,14 percent but it is not statistically significant. Based on these results it seems that the semi-strong form is not fulfilled in the Finnish stock market when observing the whole sample because a layoff announcement does not cause significant abnormal return on the event day.

Table 1. Average abnormal returns for the whole sample. Amount of observations N=257.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	0,06%	0,816	0,06%	0,816
-3	-0,02%	0,960	0,04%	0,840
-2	0,17%	0,604	0,21%	0,853
-1	0,03%	0,935	0,24%	0,837
0	-0,14%	0,657	0,10%	0,685
1	-0,01%	0,736	0,09%	0,857
2	0,12%	0,224	0,21%	0,554
3	-0,30%	0,168	-0,09%	0,982
4	0,22%	0,953	0,12%	0,998
5	-0,15%	0,372	-0,03%	0,729
6	0,36%	0,344	0,33%	0,981

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	0,24%	-0,12%	-0,14%	-0,15%	0,24%	0,33%
p-stat	0,837	0,947	0,657	0,981	0,717	0,981

*** Statistically significant at level 0.01, ** Statistically significant at level 0.05, * Statistically significant at level 0.1

Where,
AR = Average abnormal return on specified day
CAAR = Average cumulative abnormal return on specified day
p statistic = Level of statistical significance

Figure 8 illustrates graphically both average abnormal returns and cumulative average abnormal returns during the investigation period. It seems that there is no rationality in the abnormal returns. Both the average abnormal returns and the average cumulative abnormal returns for the whole sample are unsteady and the returns vary from positive to negative. However, the fluctuation is slight and the changes vary within 0,5 percent.

The results for the whole sample do not give statistically significant support for the first hypothesis according to which a final layoff announcement should cause a negative share price reaction. For instance Worrell et al. 1991 and Chen et al. 2001 found a negative market reaction due to a layoff announcement. These research results are partly in line with the previous findings because the reaction on daily basis is negative on the announcement day even though it was only a minor reaction and insignificant.

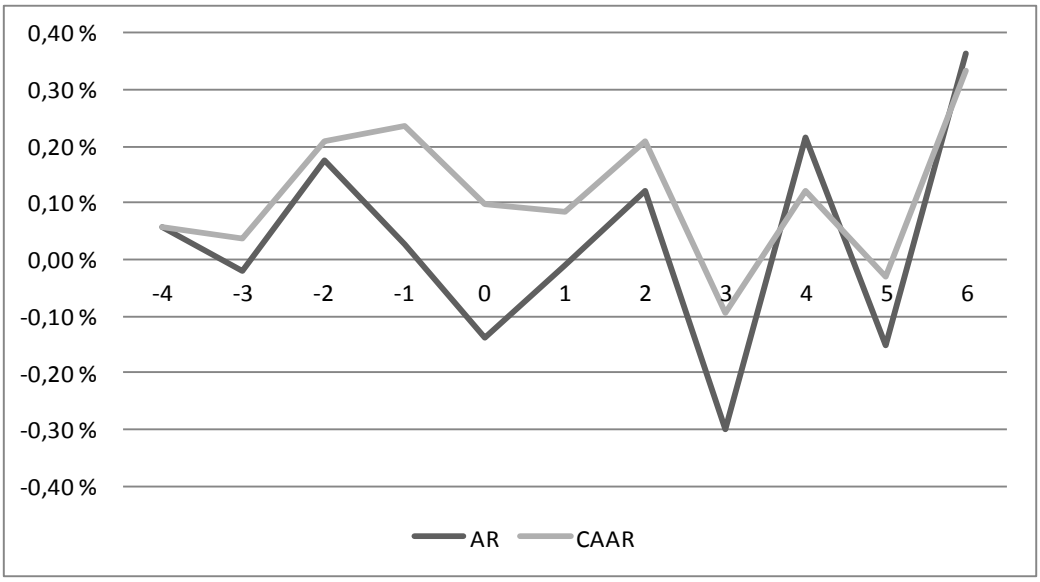

Figure 8. Average abnormal returns and average cumulative abnormal returns for the whole sample.

5.2. Inter-industry differences

The whole sample is divided into three portfolios based on the findings made by Elayan et al. (1998). The researchers found that service-oriented companies face stronger market reaction when announcing layoffs compared to manufacturing companies. Thus the three portfolios are formed: the technology portfolio, the consumption goods and services portfolio, and the manufacturing portfolio. The companies operating in the technology industry as well as the consumption goods and services industry represent service companies and the manufacturing industry represents non-service companies.

The technology industry covers almost 50 percent of the total Finnish market share. Yet the sample consist of 41 permanent layoff announcements given by 14 companies. Table 2 presents research results for the technology portfolio. The results point out that the stock price reaction to the given permanent layoff announcements is both positive and negative. More strongly the impact is positive but overall not statistically significant. The cumulative average abnormal return for the 11-day event window is 2,43 percent.

Table 2. Average abnormal returns for the technology portfolio. Amount of observations N=41.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	0,02%	0,824	0,02%	0,824
-3	-0,29%	0,807	-0,27%	0,730
-2	0,07%	0,971	-0,20%	0,771
-1	0,00%	0,712	-0,20%	0,916
0	0,27%	0,458	0,07%	0,596
1	-0,45%	0,678	-0,38%	0,991
2	0,38%	0,137	0,00%	0,601
3	0,82%	0,472	0,82%	0,426
4	0,54%	0,725	1,36%	0,276
5	-0,58%	0,369	0,78%	0,646
6	1,65%	0,335	2,43%	0,281

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	-0,20%	-0,18%	0,27%	-0,18%	2,36%	2,43%
p-stat	0,916	0,845	0,458	0,951	0,354	0,281

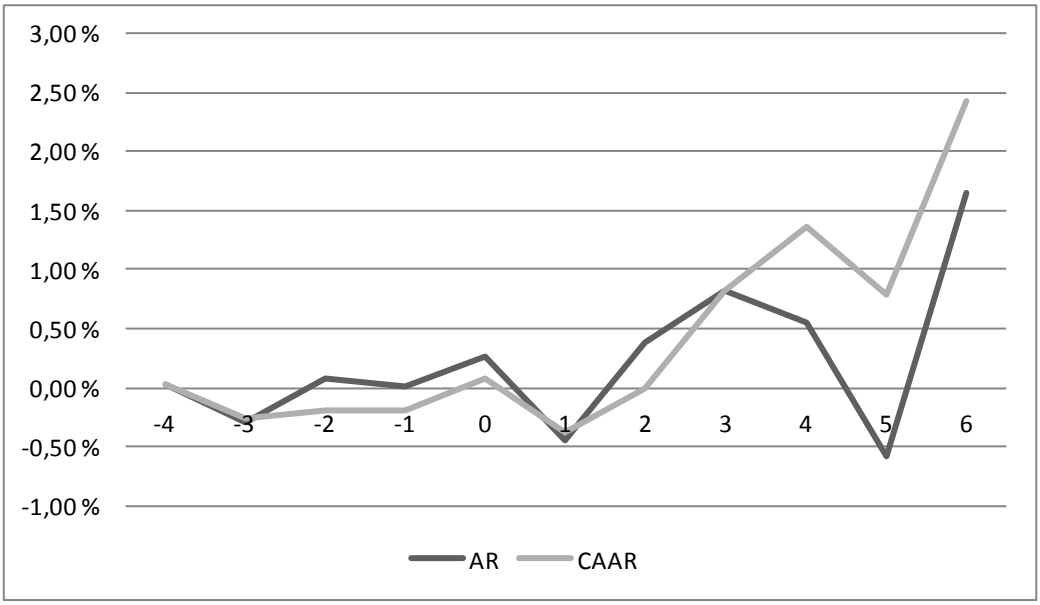

Figure 9. Average abnormal returns and average cumulative abnormal returns for the technology portfolio.

It can be noted from figure 9 that the average abnormal returns around the event day have varied within a 3 percent scale. The abnormal returns before the announcement day are close to zero which may indicate that the market is not able to predict the final announcement day. After the event day the stock price reaction starts to live and the abnormal returns occur. The drift after the permanent layoff announcement is positive except for the day 5. The post-announcement drift implies that the new information in the market is not reflected perfectly into the share price at the announcement day.

The consumption goods and services portfolio consists of 70 permanent layoff announcements given by 17 companies that operate in the industry in question. The results are presented in table 3. The stock price reaction is strongest one day before and two days after the final announcement when examining the abnormal returns on daily basis. As for the cumulative abnormal returns the reaction is best seen within days [-1,+1]. Overall, the abnormal returns are not particularly high but for day 2 the abnormal return is -0,55 percent on average and it is statistically significant at level 0.05. In addition, the average cumulative abnormal returns are statistically significant at level 0.05 during interval [+1,+6]. These results show some evidence for the abnormal returns' statistical significance within the consumption goods and services industry.

Table 3. Average abnormal returns for the consumption goods and services portfolio. Amount of observations N=70.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	-0,07%	0,573	-0,07%	0,573
-3	-0,05%	0,708	-0,12%	0,464
-2	0,29%	0,634	0,17%	0,834
-1	0,38%	0,411	0,55%	0,699
0	0,04%	0,857	0,59%	0,635
1	0,19%	0,919	0,77%	0,729
2	-0,55%**	0,012	0,22%	0,676
3	-0,32%	0,315	-0,09%	0,401
4	-0,02%	0,452	-0,11%	0,271
5	0,17%	0,826	0,07%	0,332
6	-0,04%	0,523	0,03%	0,253

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	0,55%	0,60%	0,04%	0,23%	-0,56%**	0,03%
p-stat	0,699	0,556	0,857	0,950	0,021	0,253

The average abnormal returns for the consumption goods and services portfolio are illustrated in figure 10. The variation of stock price starts three days before the event day and the cumulative abnormal return accumulates until day 1 for 0,77 percent. Next two days a clear decline near zero can be observed and the rest of observation days are steady.

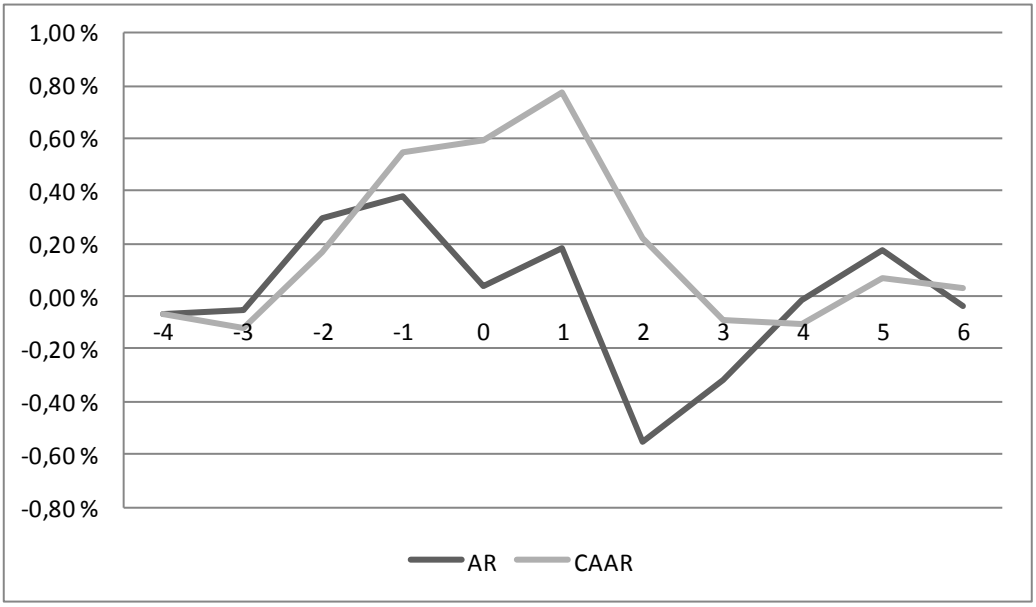

Figure 10. Average abnormal returns and average cumulative abnormal returns for the consumption goods and services portfolio.

The manufacturing industry has the greatest amount of observations among the three selected industries with 146 permanent layoffs given by 35 companies during the 6 year investigation period. Table 4 presents the average abnormal returns for the manufacturing industry and it shows that the average cumulative abnormal returns are positive before the event day and negative at the event day and after it but none of them are statistically significant. As for the daily average abnormal returns three days after permanent layoff announcement occurs a statistically significant abnormal return of -0,61 percent at level 0.05. Likewise on day 2 an abnormal return of 0,37 percent is received with weak statistical significance level of 0.1. Overall, both the abnormal returns and the cumulative abnormal returns during the investigation period are not high.

The statistically significant average abnormal return existing on day 2 is consistent with the findings in the consumption goods and services industry's research results. The ab-

normal return is negative for the consumption goods and services portfolio and positive for the manufacturing portfolio on the second day after the specified event. It may indicate that for the consumption goods and services industry permanent layoffs are interpreted as negative news and for the manufacturing as positive news. This finding is consistent with Elayan et al.'s (1998) finding about service-oriented companies suffering more than manufacturing companies in case of layoff announcements. However, it is hard to draw conclusions about the investor's behavior when examining the stock price reaction for the manufacturing industry because on the third day following the event the reaction is opposite i.e. negative.

Table 4. Average abnormal returns for the manufacturing portfolio. Amount of observations N=146.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	0,13%	0,877	0,13%	0,877
-3	0,07%	0,996	0,20%	0,918
-2	0,15%	0,711	0,34%	0,867
-1	-0,14%	0,789	0,21%	0,989
0	-0,34%	0,942	-0,13%	0,964
1	0,02%	0,999	-0,11%	0,966
2	0,37%*	0,099	-0,35%	0,843
3	-0,61%**	0,028	-0,12%	0,860
4	0,23%	0,959	-0,12%	0,860
5	-0,19%	0,654	-0,31%	0,759
6	0,20%	0,516	-0,11%	0,935

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	0,21%	-0,46%	-0,34%	-0,32%	0,02%	-0,11%
p-stat	0,989	0,900	0,942	0,951	0,866	0,935

As can be seen in figure 11 where the stock price reaction for the manufacturing portfolio is illustrated, both the average abnormal returns and the average cumulative abnormal returns fluctuate and do not have any conformity. On days 2 and 3 when statistically significant average abnormal returns are obtained the stock price reaches its highest as well as lowest points within the 11-day event window. The average cumulative abnormal returns are positive before the event day and the rest of the period they stay negative.

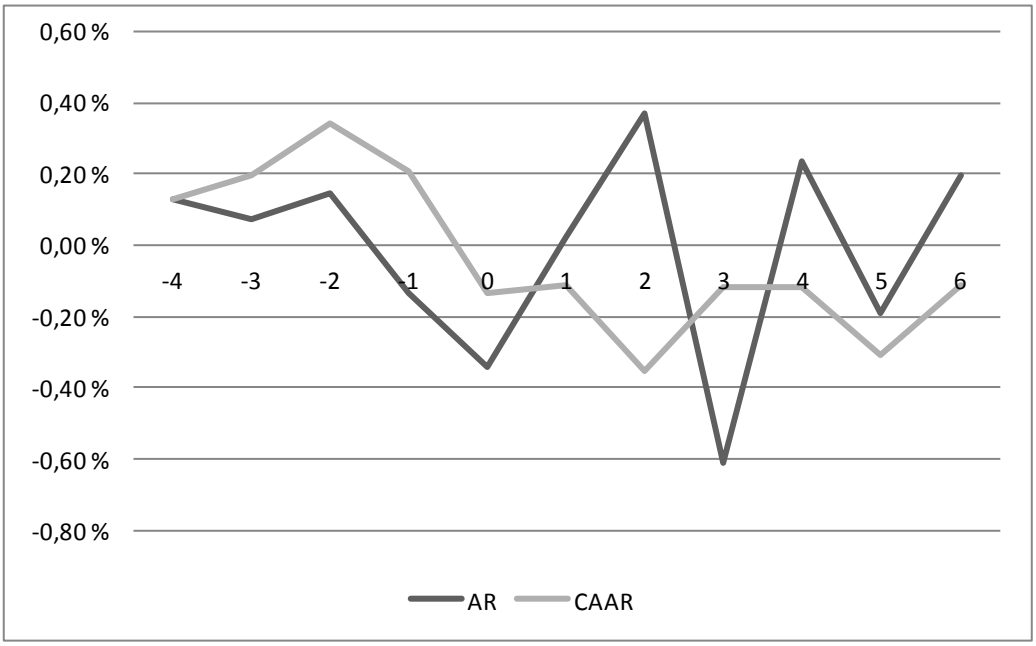

Figure 11. Average abnormal returns and average cumulative abnormal returns for the manufacturing portfolio.

The results obtained when observing the industries separately did not give unambiguous evidence about the inter-industry differences. As given permanent layoff announcements are focused on the manufacturing industry (see figure 5), and more importantly in order to test whether the same reaction is observed in the Finnish market as Elayan et al. (1998) found in the U.S. market, a new portfolio is formed. The new portfolio consists of companies that are operating in the technology and in the consumption goods and services industries. The combined portfolio is called service-oriented companies portfolio and it features 111 announcements. The combined portfolio is built in order to test does Elayan et al.'s (1998) finding about the difference in market reaction exist in the Finnish stock market i.e. whether the stocks in the service-oriented companies react more strongly to permanent layoff announcements than the manufacturing industry's stocks.

A comparison of average abnormal returns between the service-oriented companies portfolio and the manufacturing portfolio is shown in table 5. As it can be noted from the results there are no remarkable differences between the two portfolios under observation. There is only one statistically approximate average abnormal return of -0,58 percent (significant at level 0.1) during the 11-day event window and it occurs two days after the final layoff announcement. On the release day of the announcement the ser-

vice-oriented companies portfolio faces 0,47 percent stronger positive abnormal return on average than the manufacturing portfolio but the difference is not statistically significant. The average cumulative abnormal returns point out that for days -4 to -2 the difference is negative and for the rest of the observation days it is positive except for day 2. An abnormal return of 1,03 percent is accumulated for the whole period.

Table 5. Differences in average abnormal returns between the service-oriented companies portfolio and the manufacturing portfolio. Amount of observations in the manufacturing portfolio N=146 and in the service-oriented companies portfolio N=111.

day (t)	AR	t-statistic for AR	CAAR	p-statistic for CAAR
-4	-0,16%	0,633	-0,16%	0,633
-3	-0,21%	0,468	-0,38%	0,395
-2	0,07%	0,860	-0,31%	0,600
-1	0,37%	0,316	0,06%	0,928
0	0,47%	0,201	0,53%	0,467
1	-0,07%	0,884	0,46%	0,605
2	-0,58%*	0,094	-0,12%	0,900
3	0,71%	0,145	0,59%	0,581
4	-0,04%	0,934	0,55%	0,599
5	0,08%	0,861	0,64%	0,574
6	0,39%	0,405	1,03%	0,360

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	0,06%	0,77%	0,47%	0,40%	0,50%	1,03%
p-stat	0,928	0,249	0,201	0,493	0,557	0,360

The average cumulative abnormal returns for the service-oriented companies portfolio (see appendix 2 for research results of the service-oriented companies portfolio) and the manufacturing portfolio are graphically presented in figure 12. It can be seen that the market reaction caused by a permanent layoff announcement is reverse for the two portfolios. Where the market reaction for the manufacturing portfolio is positive, it is negative for the service-oriented companies portfolio and whereas it is negative for the manufacturing portfolio, it is positive for the service-oriented companies portfolio. Both portfolios have their greatest leaps before the event. The abnormal returns for the manufacturing portfolio decrease before the event day and after the returns remain somewhat stable for rest of the investigation period. The abnormal returns for the service-oriented

companies portfolio on the other hand start to increase three days before the event and after the announcement they vary a little before they leap to reach their highest value.

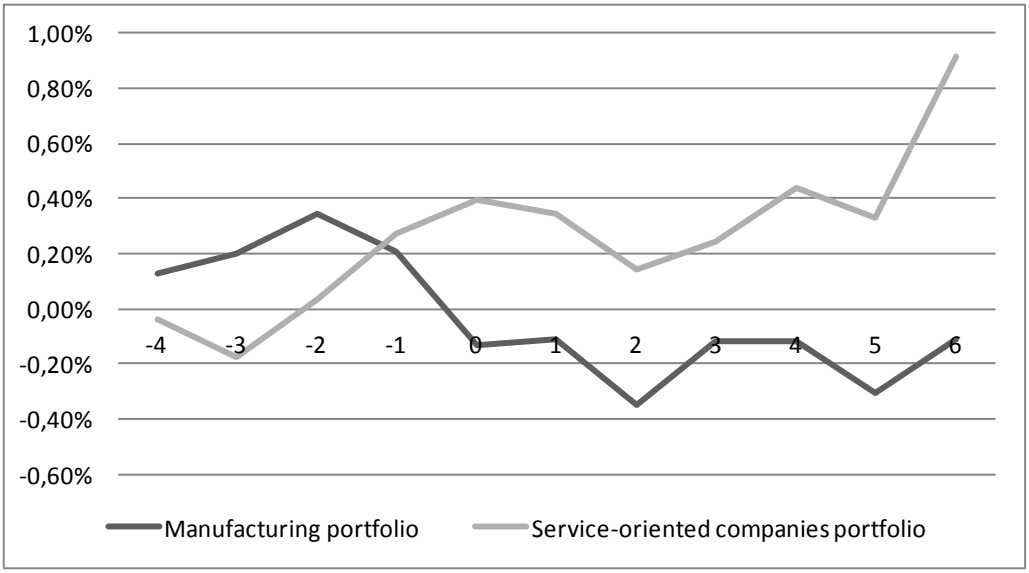

Figure 12. Average cumulative abnormal returns for the service-oriented companies portfolio and the manufacturing portfolio.

In their study Elayan et al. (1998) found that service industry firms were more negatively affected by a layoff announcement compared to manufacturing industry firms. Based on the aforementioned finding the second research hypothesis was built and it stated that there is a difference in the market reaction caused by a final layoff announcement between the chosen industries. These results provide only weak support for the second hypothesis as there are differences in the market reaction between the service-oriented companies portfolio and the manufacturing portfolio. On the second day after the event day service-oriented companies portfolio faces -0,58 percent stronger negative abnormal return at significance level 0.1 than manufacturing portfolio.

5.3. Business cycle portfolios

Ursel and Armstrong-Stassen (1995) and Chatrath et al. (1995) have noted in their studies that different economical situations may have an impact on stock price reaction caused by a final layoff announcement. Elayan et al. (1998) found that a layoff announcement given during a downturn period causes a more negative market reaction

compared to one given during an upturn period. The third hypothesis in this study relates to the business cycles and the difference in the market reaction between them.

In this study upturn and downturn periods are defined based on OMX Helsinki CAP index. An upturn period is interpreted to change to a downturn period when the index reaches its highest value. Thus a downturn period is assumed to change to an upturn period when the index reaches its lowest value. As it can be seen from figure 13 where the development of OMX Helsinki CAP index is illustrated four business cycles can be observed within years 2006–2011. The upturn periods take place from January 2nd 2006 until October 31st 2007 and from March 10th 2009 until February 1st 2011 and as for the downturn periods from November 1st 2007 until March 9th 2009 and from February 2nd 2011 until December 30th 2011.

The research material consists of 257 final layoff announcements and it is divided into two subsamples based on the business cycle during which the announcement was given and furthermore based on the industry in which it was given (see figure 6). 162 final layoff announcements were given during the economical upturn periods and respectively 95 announcements took place during the downturn periods. It may seem irrational that there are more observations during the upturn periods than during downturn periods but the reason is that most negotiations concerning deduction of a workforce are started during a regression. Nevertheless, processes take sometimes a long time or soon after the beginning of negotiations markets begin to recover in which case the final decision is made during an upturn period.

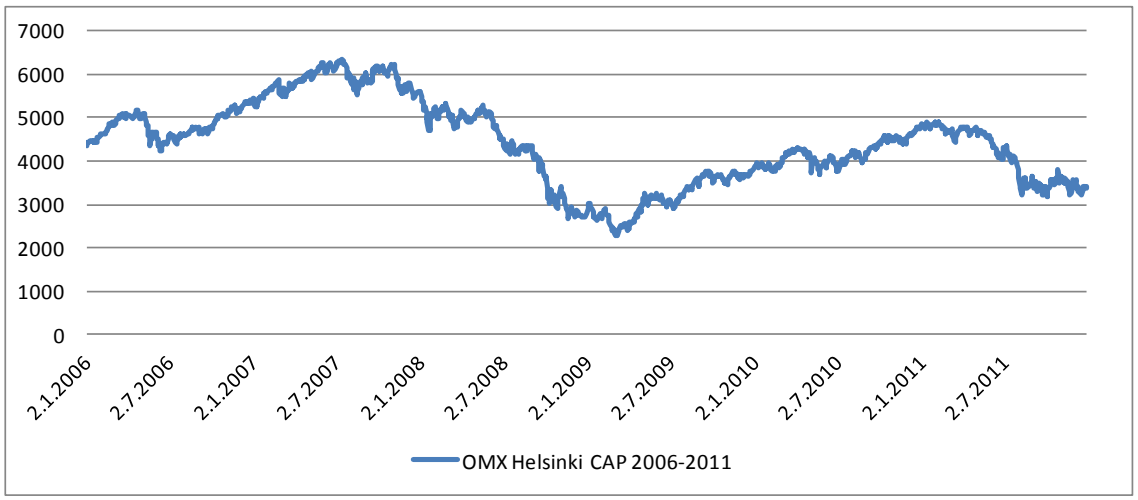

Figure 13. Development of OMX Helsinki CAP index during the investigation period.

The following subtitles provide empirical evidence on how the market reacts to layoff announcements given during the upturn and downturn periods for the whole sample and for the three chosen industries. Finally, the differences in market reactions between the upturn and downturn periods are presented.

5.3.1. Upturn periods

Table 6 shows the average abnormal returns caused by permanent layoff announcements given during the upturn periods for the whole sample under observation. The results indicate only weak statistical significance with an average abnormal return of 0,65 percent on day 6 at level 0.10. The cumulative abnormal returns are positive for the whole 11-day event window cumulating 1,53 percent on average. Overall, new information in the stock market seems to have no considerable impact on stock prices when the whole sample is considered.

Table 6. Average abnormal returns during upturn periods for the whole sample. Amount of observations N=162.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	0,14%	0,932	0,14%	0,932
-3	0,18%	0,416	0,32%	0,627
-2	0,40%	0,235	0,72%	0,269
-1	0,13%	0,558	0,85%	0,528
0	0,34%	0,242	1,19%	0,233
1	-0,10%	0,524	1,09%	0,554
2	0,17%	0,521	1,26%	0,406
3	-0,35%	0,113	0,91%	0,905
4	0,26%	0,469	1,17%	0,608
5	-0,30%	0,299	0,88%	0,988
6	0,65%*	0,074	1,53%	0,441

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	0,85%	0,37%	0,34%	0,25%	0,34%	1,53%
p-stat	0,528	0,874	0,242	0,888	0,992	0,441

The results for the technology industry during the economical upturn periods are presented in table 7 from which it turns out that the average abnormal returns on daily basis

are negative but close to zero before the event day. The greatest abnormal return of 2,69 percent is discovered on the last day of the event window. However, none of the average abnormal returns are statistically significant hence the results cannot be generalized. On the other hand it is necessary to point out that there are no more than 24 permanent layoffs given by companies working in the field of technology during the upturn periods whereupon the results can be volatile.

Table 7. Average abnormal returns during upturn periods for the technology portfolio. Amount of observations N=24.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	-0,01%	0,933	-0,01%	0,933
-3	-0,73%	0,329	-0,74%	0,523
-2	-0,27%	0,538	-1,01%	0,400
-1	-0,36%	0,296	-1,37%	0,172
0	1,15%	0,243	-0,22%	0,564
1	-1,06%	0,508	-1,28%	0,359
2	0,36%	0,451	-0,93%	0,534
3	0,30%	0,477	-0,63%	0,723
4	1,12%	0,592	0,49%	0,882
5	-1,72%	0,271	-1,23%	0,415
6	2,69%	0,154	1,45%	0,713

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	-1,37%	-0,27%	1,15%	0,09%	1,67%	1,45%
p-stat	0,172	0,608	0,243	0,795	0,337	0,713

Table 8 shows the average abnormal returns for the consumption goods and services industry. According to the results, two days after the announcement day there exists a statistically significant abnormal return and it is -0,6 percent on average at the significance level of 0.05. This research result is in line with the result gotten when observing the average abnormal returns for the same industry but including all the layoff announcements given within the investigation period of six years.

Table 8. Average abnormal returns during upturn periods for the consumption goods and services portfolio. Amount of observations N=48.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	0,01%	0,590	0,01%	0,590
-3	-0,06%	0,574	-0,05%	0,411
-2	0,52%	0,407	0,47%	0,969
-1	0,43%	0,723	0,90%	0,818
0	0,13%	0,711	1,03%	0,643
1	0,23%	0,915	1,25%	0,680
2	-0,6%**	0,018	0,65%	0,687
3	0,08%	0,863	0,73%	0,661
4	-0,04%	0,709	0,69%	0,599
5	0,20%	0,635	0,88%	0,704
6	0,15%	0,689	1,04%	0,785

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	0,90%	0,78%	0,13%	0,35%	0,01%	1,04%
p-stat	0,818	0,623	0,711	0,729	0,233	0,785

The manufacturing industry represents the last sample when focusing on the market reaction caused by a final layoff announcement given during the upturn periods and it provides the most noteworthy results so far. As it can be seen from table 9 statistically significant abnormal returns appear both in average abnormal returns and average cumulative abnormal returns as well as both before and after the announcement day. However, there are no significant average abnormal returns on the announcement day nor within the chosen intervals.

What is notable is that the daily average abnormal return on the event day is only 0,25 percent and it is not statistically significant. The average abnormal returns are statistically significant at level 0.05 three days before (0,55 %) and three days after (-0,76 %) the announcement. Also on day 2 occurs an average abnormal return of 0,54 percent at level 0.1. As for the average cumulative abnormal returns the returns are throughout the event window positive but the statistically significant abnormal returns are gained two days before and two days after the final layoff announcement day. A cumulative abnormal return of 1,31 percent on average is significant at level 0.1 on day -2 and on day 2 average cumulative abnormal return is 2,18 percent at significance level of 0.05.

Table 9. Average abnormal returns during upturn periods for the manufacturing portfolio. Amount of observations N=90.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	0,25%	0,804	0,25%	0,804
-3	0,55%**	0,044	0,80%	0,135
-2	0,52%	0,248	1,31%*	0,073
-1	0,09%	0,580	1,41%	0,208
0	0,25%	0,494	1,65%	0,142
1	-0,01%	0,812	1,64%	0,191
2	0,54%*	0,084	2,18%**	0,049
3	-0,76%**	0,024	1,42%	0,491
4	0,20%	0,494	1,62%	0,387
5	-0,18%	0,623	1,44%	0,506
6	0,37%	0,327	1,81%	0,372

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	1,41%	0,33%	0,25%	0,23%	0,15%	1,81%
p-stat	0,208	0,936	0,494	0,754	0,987	0,372

All things considering it seems that the new information that final layoff announcements bring to the stock market is not reflected perfectly and without delay to the stock prices in the manufacturing industry because statistically significant abnormal returns appear after the event day. In addition, there are also statistically significant average abnormal returns two days before the announcement which may indicate that investors are capable of predicting the day of the final layoff announcement.

It can be concluded that these research results point out that permanent layoff announcements given during the economical upturn periods have a significant impact on the stock market. These results indicate strong evidence for the manufacturing industry and suggestive evidence for the subsample as a whole and for the consumption goods and services industry. The technology portfolio alone did not provide a support for the matter. The statistically significant abnormal returns are both positive and negative. The average cumulative abnormal returns are mainly positive during the upturn periods for the whole subsample, the consumption goods and services industry, and the manufacturing industry. However, for the technology industry the market reaction for permanent layoff announcements is mainly negative.

5.3.2. Downturn periods

In this chapter the average abnormal returns achieved when companies announce their final layoffs during the economical downturn periods are presented for the whole sample and to every chosen industry separately. It is necessary to point out that there are less than 100 observations in the whole subsample. Especially when it comes to the permanent layoffs given by companies working in the field of technology as well as in the consumption goods and services industry there is a limited amount of observations during the downturn periods whereupon the results can be biased.

Table 10 presents the average abnormal returns caused by final layoff announcements given during the downturn periods for the whole sample under empirical examination. According to the research results, permanent layoffs do not seem to have an impact on stock returns when all three industries are considered. The average abnormal returns are mainly close to zero except for the event day with -0,98 percent, however it is not statistically significant. The average cumulative abnormal returns are throughout the 11-day event window negative but none of the days gain statistically significant return.

Table 10. Average abnormal returns during downturn periods for the whole sample. Amount of observations N=95.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	-0,06%	0,887	-0,06%	0,887
-3	-0,41%	0,472	-0,47%	0,557
-2	-0,10%	0,847	-0,57%	0,583
-1	-0,11%	0,399	-0,67%	0,898
0	-0,98%	0,611	-1,65%	0,716
1	0,11%	0,842	-1,54%	0,803
2	-0,09%	0,447	-1,63%	0,970
3	-0,25%	0,562	-1,88%	0,826
4	0,18%	0,366	-1,70%	0,614
5	0,13%	0,999	-1,58%	0,630
6	0,05%	0,576	-1,52%	0,526

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	-0,67%	-0,97%	-0,98%	-0,87%	0,13%	-1,52%
p-stat	0,898	0,776	0,611	0,782	0,607	0,526

As for the technology portfolio, table 11 shows the average abnormal returns caused by permanent layoffs given during the downturn periods. The average abnormal returns vary from -0,98 percent on the announcement day to 1,56 percent on the third day after the event day. The average abnormal returns on daily basis are not noteworthy. The average cumulative abnormal returns indicate statistical significance at level 0.05 right after the announcement day lasting for two days. The abnormal return is cumulatively 0,89 percent on average one day after and 1,30 percent on average two days after the final layoff announcement. The average abnormal return accumulates nearly 4 percent for the whole investigation period.

Table 11. Average abnormal returns during downturn periods for the technology portfolio. Amount of observations N=17.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	0,05%	0,644	0,05%	0,644
-3	0,34%	0,200	0,39%	0,266
-2	0,56%	0,630	0,95%	0,321
-1	0,51%	0,675	1,45%	0,174
0	-0,98%	0,905	0,48%	0,120
1	0,41%	0,454	0,89%**	0,039
2	0,41%	0,230	1,30%**	0,047
3	1,56%	0,682	2,86%	0,128
4	-0,26%	0,678	2,59%	0,203
5	1,03%	0,771	3,63%	0,186
6	0,18%	0,336	3,81%	0,254

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	1,45%	-0,06%	-0,98%	-0,57%	3,33%	3,81%
p-stat	0,174	0,523	0,905	0,662	0,595	0,254

From table 12 the average abnormal returns can be seen for the consumption goods and services portfolio, and it shows that the average cumulative abnormal returns stay negative for the whole time. The final layoff announcements seem to have no significant impact on the stock returns during the economical downturn periods. Only one piece of evidence is received when observing the cumulative abnormal returns on average within intervals. A statistically significant cumulative abnormal return of -1,80 percent at level 0.05 is gained during time interval [+1,+6].

Table 12. Average abnormal returns during downturn periods for the consumption goods and services portfolio. Amount of observations N=22.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	-0,24%	0,812	-0,24%	0,812
-3	-0,05%	0,922	-0,29%	0,915
-2	-0,20%	0,637	-0,49%	0,726
-1	0,27%	0,289	-0,23%	0,749
0	-0,14%	0,647	-0,37%	0,877
1	0,10%	0,704	-0,27%	0,979
2	-0,44%	0,638	-0,71%	0,874
3	-1,18%	0,250	-1,89%	0,443
4	0,05%	0,444	-1,84%	0,279
5	0,12%	0,810	-1,72%	0,263
6	-0,45%	0,173	-2,17%	0,116

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	-0,23%	0,22%	-0,14%	-0,04%	-1,80%**	-2,17%
p-stat	0,749	0,695	0,647	0,595	0,029	0,116

Permanent layoff announcements' impact on stock prices during the downturn periods for the manufacturing portfolio are presented in table 13. The results do not show any statistical significance among both average abnormal returns and average cumulative abnormal returns. The average abnormal returns stay close to zero around the event day. Highest yet not statistically significant abnormal return of -1,31 percent is achieved on the announcement day. The cumulative abnormal returns stay constantly negative reaching their highest value of -3,32 percent on day 3.

These research results do not strongly prove that permanent layoff announcements given during the economical downturn periods have a significant impact on the stock market. The results indicate only extremely weak evidence for the matter. The average cumulative abnormal returns are altogether negative during the downturn periods for the whole sample, the consumption goods and services industry and the manufacturing industry. As for the technology industry, where the most statistically significant results among these subsamples are achieved, the market reaction for permanent layoff announcements is positive.

Table 13. Average abnormal returns during downturn periods for the manufacturing portfolio. Amount of observations N=56.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	-0,02%	0,787	-0,02%	0,787
-3	-0,78%	0,138	-0,80%	0,230
-2	-0,25%	0,799	-1,06%	0,301
-1	-0,44%	0,793	-1,49%	0,431
0	-1,31%	0,698	-2,80%	0,358
1	0,02%	0,994	-2,77%	0,408
2	-0,11%	0,738	-2,88%	0,518
3	-0,43%	0,403	-3,32%	0,348
4	0,36%	0,611	-2,96%	0,259
5	-0,14%	0,946	-3,10%	0,275
6	0,21%	0,611	-2,89%	0,354

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	-1,49%	-1,72%	-1,31%	-1,28%	-0,09%	-2,89%
p-stat	0,431	0,903	0,698	0,711	0,784	0,354

As mentioned before, Ursel and Armstrong-Stassen (1995) and Chatrath et al. (1995) stated that different business cycles may have an impact on a stock price reaction caused by a final layoff announcement. These findings do support the fact that layoffs do cause a market reaction. However, it is hard to make profound conclusions when the results for the upturn and downturn periods are presented separately. In the following subtitle the differences in the market reaction between different business cycles are shown in order to be able to find out if a layoff announcement given during the downturn periods causes a more negative market reaction compared to one given during the upturn periods as Elayan et al. (1998) found in their study.

5.3.3. Differences between downturn and upturn periods

The differences in average abnormal returns for the whole sample between the economical upturn and downturn periods are presented in table 14 from which it turns out that there are statistically significant differences in both the average abnormal returns and the average cumulative abnormal returns between the economical business cycles. The results reveal that the stock price reaction is negatively stronger during the downturn periods. On the release day the difference in the average abnormal returns between the

business cycles is -1,32 percent at significance level 0.01. A statistically significant difference in the average abnormal returns occurs also three days before the event day with -0,59 percent at level 0.1

The average cumulative abnormal returns provide strong empirical evidence about the differences in the abnormal returns between the downturn and upturn periods. The average cumulative abnormal returns stay negative for the whole investigation period. Statistically significant differences start to show two days before the announcement day and continue significant through the investigation period. On the event day a negative cumulative abnormal return difference of nearly three percent is achieved at 0.001 level of significance. The differences in returns two days before the announcement are significant at level 0.1 and two days after at level 0.01. For the days [+3,+6] the difference is significant at level 0.05 except for day 5 when it is only significant at level 0.1.

Table 14. Differences in average abnormal returns between downturn and upturn periods for the whole sample. Amount of observations in upturn N=162 and in downturn N=95.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	-0,20%	0,611	-0,20%	0,611
-3	-0,59%*	0,076	-0,79%	0,116
-2	-0,50%	0,262	-1,29%*	0,061
-1	-0,23%	0,567	-1,52%*	0,056
0	-1,32%***	0,001	-2,89%****	0,001
1	0,21%	0,641	-2,63%***	0,006
2	-0,26%	0,496	-2,90%***	0,006
3	0,10%	0,851	-2,79%**	0,019
4	-0,09%	0,846	-2,88%**	0,015
5	0,42%	0,326	-2,45%*	0,051
6	-0,59%	0,160	-3,05%**	0,018

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	-1,52%*	-1,35%**	-1,32%***	-1,11%**	-0,21%	-3,05%**
p-stat	0,056	0,044	0,001	0,038	0,824	0,018

**** Statistically significant at level 0.001, *** Statistically significant at level 0.01, ** Statistically significant at level 0.05, * Statistically significant at level 0.1

Additionally when observing the differences in the average cumulative abnormal returns between the downturn and upturn periods within intervals it can be noted that the differences are altogether statistically significant except for interval [+1,+6]. Figure 14 illustrates how the stock market reacts to layoff announcements given during the upturn and downturn periods for the whole sample. It can be noted that in both cases the cumulative abnormal returns are close to zero on the first investigation day and the difference between returns is minimal. However, the differences between the returns start to widen immediately on the second observation day. During the upturn periods the cumulative abnormal returns start to increase towards the end causing a positive trend whereas the trend is opposite during the downturn periods. Overall, the stock price reaction is negative during the downturn periods and positive during the upturn periods.

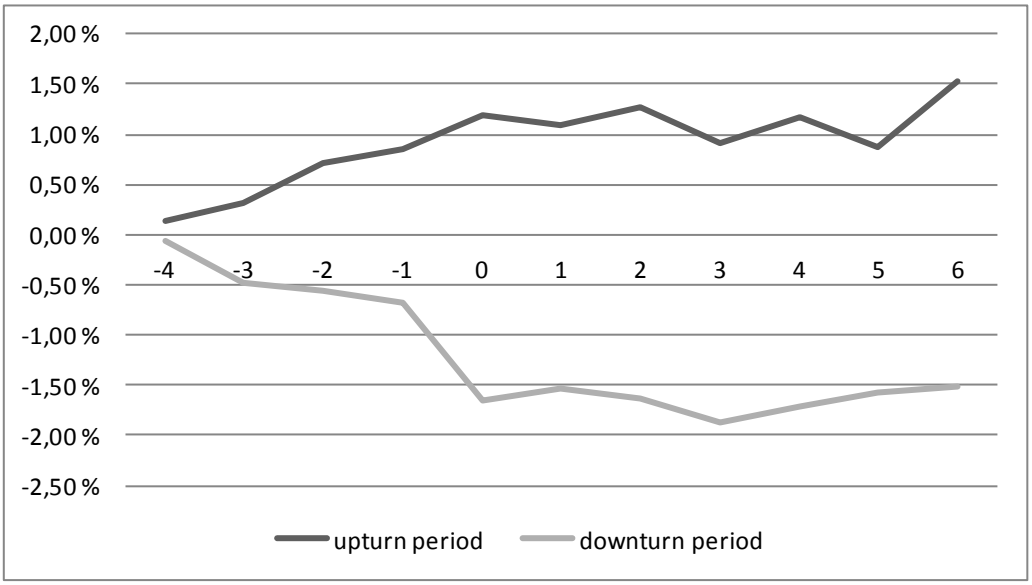

Figure 14. Average cumulative abnormal returns during upturn and downturn periods for the whole sample.

Comparison of the average abnormal returns between the downturn periods and the upturn periods within the technology portfolio is shown in table 15. The technology portfolio does not provide as strong evidence as the whole sample did but it can be seen that on the event day the difference between the daily abnormal returns is -2,13 percent on average and it is significant at level 0.05. Whereas the difference in the cumulative abnormal returns is negative for 11 days surrounding the event day when the whole sample was considered, it is positive for the technology portfolio. As for the average cumu-

lative abnormal returns the difference (2,82 %) is statistically significant one day before the announcement at level 0.1.

Table 15. Differences in average abnormal returns between downturn and upturn periods for the technology portfolio. Amount of observations in upturn N=24 and in downturn N=17.

day (t)	AR	statistic for AR	CAAR	p-statistic for CAAR
-4	0,06%	0,955	0,06%	0,955
-3	1,07%	0,105	1,13%	0,323
-2	0,83%	0,394	1,96%	0,234
-1	0,86%	0,318	2,82%*	0,082
0	-2,13%**	0,012	0,70%	0,644
1	1,47%	0,441	2,17%	0,362
2	0,06%	0,958	2,22%	0,420
3	1,26%	0,599	3,49%	0,365
4	-1,38%	0,506	2,10%	0,576
5	2,76%	0,169	4,86%	0,254
6	-2,51%	0,175	2,35%	0,545

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	2,82%*	0,21%	-2,13%**	-0,65%	1,66%	2,35%
p-stat	0,082	0,924	0,012	0,756	0,640	0,545

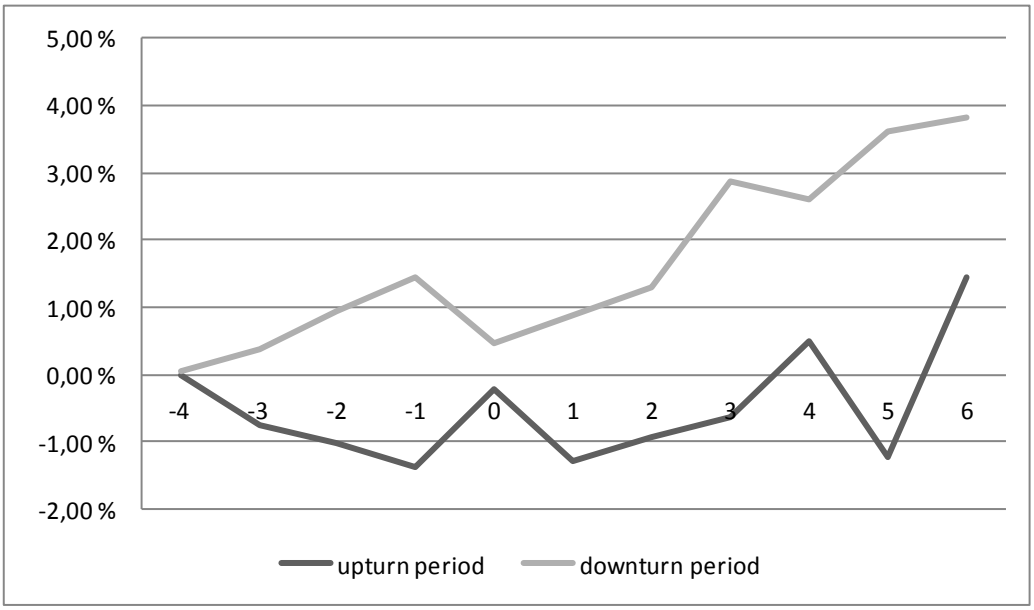

Figure 15. Average cumulative abnormal returns during upturn and downturn periods for the technology portfolio.

Figure 15 above illustrates the differences between the average cumulative abnormal returns during different business cycles for the technology portfolio. The reaction to final layoff announcements during the downturn periods is positive for the whole observation period whereas it is mainly negative during the upturn periods. The difference in returns is trivial on the first observation day but the difference starts to evolve directly after it. The developments of both periods' returns are mirroring each other until the layoff announcement day. For four days following the announcement the returns mainly increase in both economical cycles and for the downturn periods the growth continue until the last observation day. On day 5 the returns during the upturn periods in the economy decrease over 1,5 percent causing nearly five percent difference between the returns. On the last observation day returns during the upturn periods increase to reach their highest positive value.

Differences in the abnormal returns caused by a permanent layoff announcement for the consumption goods and services industry are presented in table 16. As seen from the table the differences in the daily average abnormal returns between different business cycles are not substantial and none of them are statistically significant. The greatest difference occurs three days after the event day but it is not statistically significant. As for the average cumulative abnormal returns, the differences are negative for the whole event window and grow towards the end of the observation period. Statistically significant differences arise during the last four days. On days 3, 4 and 5 the differences in the returns are approximately -2,50 percent on average and they are significant at level 0.1. On the last observation day the difference is -3,21 percent at level 0.05.

Figure 16 shows graphically how stock prices react to the new information, regarding the final layoff announcements, in the market during the upturn and downturn periods. The stock price reaction is negative when a layoff announcement is given during the downturn periods and positive when it is given during the economical upturn periods. It can be seen that the magnitude of the reaction is greater during the downturn periods. The average cumulative abnormal returns do not vary much within the first seven observation days during the downturn periods but three days after the given announcement the returns decline clearly and stay on the same level for the rest of the time. As for the reaction during the upturn periods, the cumulative abnormal returns start to increase before the event day and continue increasing until the first day after the announcement day after which they decrease slightly and remain stable for the rest of time.

Table 16. Differences in average abnormal returns between downturn and upturn periods for the consumption goods and services portfolio. Amount of observations in upturn N=48 and in downturn N=22.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	-0,25%	0,667	-0,25%	0,667
-3	0,00%	0,993	-0,25%	0,711
-2	-0,72%	0,158	-0,97%	0,258
-1	-0,16%	0,834	-1,13%	0,286
0	-0,27%	0,639	-1,39%	0,152
1	-0,13%	0,767	-1,52%	0,170
2	0,17%	0,691	-1,36%	0,262
3	-1,26%	0,140	-2,62%*	0,081
4	0,09%	0,846	-2,52%*	0,077
5	-0,08%	0,858	-2,61%*	0,085
6	-0,60%	0,134	-3,21%**	0,044

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	-1,13%	-0,56%	-0,27%	-0,40%	-1,81%	-3,21%**
p-stat	0,286	0,556	0,639	0,584	0,128	0,044

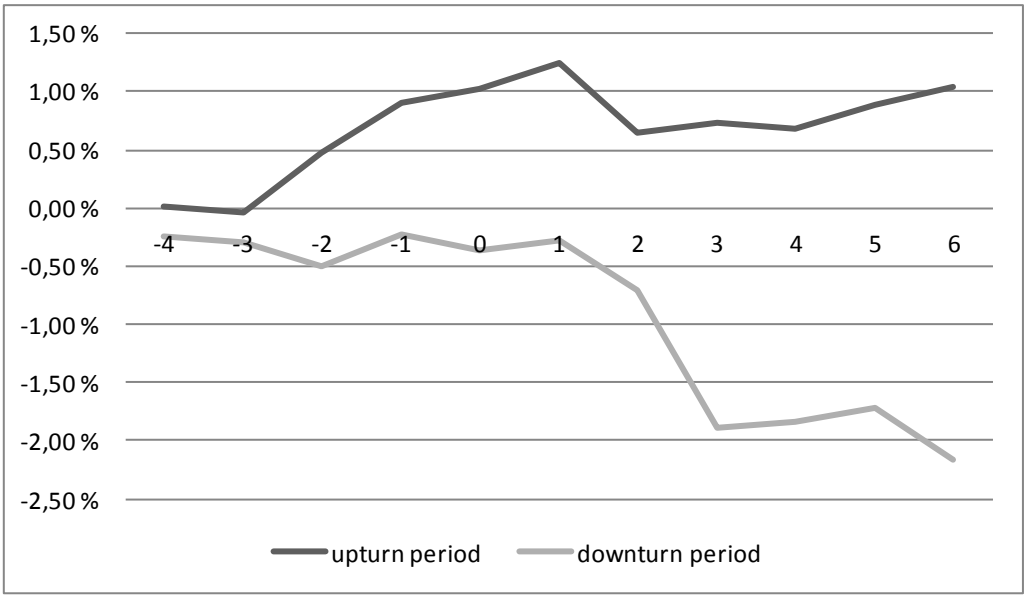

Figure 16. Average cumulative abnormal returns during upturn and downturn periods for the consumption goods and services portfolio.

Finally, as for the manufacturing portfolio the differences between the downturn and upturn periods are shown in table 17 from which can be seen that the differences in the abnormal daily returns start to show already before the permanent layoff announcement day. The difference is -1,33 percent on average three days before the announcement and it is statistically significant at level 0.01. Another statistically significant difference (-1,55 %) among the daily abnormal returns occurs on the announcement day also at level 0.01. When observing the differences among the average cumulative abnormal returns the results indicate strong empirical evidence to support that there are significant differences in returns between the downturn and upturn periods. The differences between the returns are statistically significant within the event window except for the first observation day. As it can be seen from table 17 the differences between the business cycles start to show already before the announcement day. For three days before the announcement the differences are statistically significant at level 0.05. On day -1 the difference has accumulated to -2,90 percent. On the event day the difference is as much as -4,45 percent and it is significant at level 0.001. On following days after the announcement the differences in returns stay statistically significant at level 0.01 and the difference is approximately -4,50 percent.

Table 17. Differences in average abnormal returns between downturn and upturn periods for the manufacturing portfolio. Amount of observations in upturn N=90 and in downturn N=56.

day (t)	AR	statistic for AR	CAAR	p-statistic for CAAR
-4	-0,27%	0,638	-0,27%	0,638
-3	-1,33%***	0,009	-1,60%**	0,035
-2	-0,77%	0,249	-2,37%**	0,021
-1	-0,53%	0,342	-2,90%**	0,015
0	-1,55%***	0,009	-4,45%****	0,001
1	0,04%	0,949	-4,42%***	0,002
2	-0,65%	0,251	-5,06%***	0,001
3	0,33%	0,529	-4,74%***	0,003
4	0,16%	0,756	-4,58%***	0,004
5	0,04%	0,940	-4,54%***	0,006
6	-0,15%	0,768	-4,69%***	0,008

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	-2,90%**	-2,05%**	-1,55%***	-1,52%**	-0,24%	-4,69%***
p-stat	0,015	0,022	0,009	0,024	0,831	0,008

Figure 17 illustrates the differences between the cumulative abnormal returns caused by a final layoff announcement given to the stock market in the upturn and downturn periods. As it can be noted the reactions are opposite. The reaction is stronger during the downturn periods and it is negative whereas the market reaction during the upturn periods is positive. The differences in the returns increase on the announcement day and remain quite stable until the end of the event window.

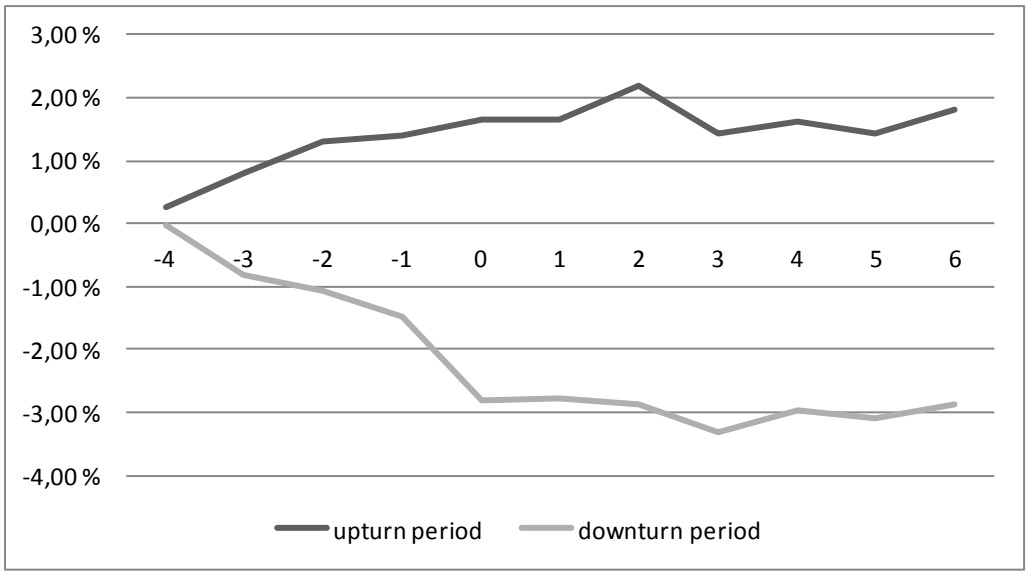

Figure 17. Average cumulative abnormal returns during upturn and downturn periods for the manufacturing portfolio.

When calculating the difference between the abnormal returns caused by the permanent layoff announcements during the downturn and upturn periods it can be clearly concluded that there are statistically significant differences in the market reactions. These results are in line with Elayan et al.'s (1998) findings indicating that layoff announcements given during downturn periods are reflected more negatively in to the stock prices compared to ones given during upturn periods. For the whole sample, the consumption goods and services portfolio, and the manufacturing portfolio the market reaction was solely negative. As for the technology portfolio the market reaction on the announcement day was negative but the cumulative abnormal return one day before the event day was positive but only at significance level 0.1.

6. CONCLUSIONS

The purpose of this study was to find out whether permanent layoff announcements cause market reactions in the Finnish stock market. In addition, the aim was to study whether there are differences in market reactions across industries and business cycles. Furthermore, one point of view was to examine if Fama's semi-strong form of market efficiency is fulfilled in the Finnish market. The investigation period covered years 2006–2011 during which 257 final layoff announcements were given by 66 companies operating in one of the selected industries. 146 of the announcements were given in the manufacturing industry, 70 in the consumption goods and services industry, and 41 in the technology industry.

In the beginning of this study a short introduction into the subject was given as well as the purpose of the study and the three research hypotheses were built in order to create a basis for this study. The introduction chapter also included the contribution of this study and recapping the structure that the study followed. The second chapter built a basis for the empirical part as some of the previous studies concerning layoff announcements' impact on stock price reaction were presented. This part covered studies about the subjects discussed in the part of hypotheses' formation. The third chapter consisted of the theoretical part which created a framework for the empirical part. Fama's efficient market hypothesis was introduced as well as two commonly used economic models for stock valuation. The next two chapters included the empirical part of this thesis. First, in chapter four, the data was presented and its classification based on the research hypotheses was made. The event study methodology was introduced and finally it was followed by the research results obtained by using the selected methods.

Based on the research results it can be noted that the findings were not completely unambiguous. These findings partly supported the research hypotheses and the previous studies' findings. In two hypotheses the null hypothesis was rejected and in one hypothesis it was accepted. The findings also imply that the semi-strong form of market efficiency does not seem to fulfill in the Finnish market. The conclusion can be made due to two reasons. First, as one null hypothesis is accepted it refers to that a new piece of information is not reflected into the stock price without a delay which is an implication of inefficiency in the market. Second, a new piece of information should be without a delay reflected into the stock price but the results show that there are statistically significant abnormal returns mainly after the announcement day and even before.

The first hypothesis was built to find out whether a final layoff announcement causes a stock price reaction. The sample to test the first hypothesis consisted of 257 observations and it represented the whole sample before the split to industries was done. A share's price is an indicator for the expectations of its future profit. According to the presented previous studies, layoff announcements are usually seen as negative news which leads to lowering the value of companies that announce layoffs. As per the research results, investors do not react statistically significantly to a final layoff announcement in the Finnish stock market. However, the reaction on the announcement day was negative but as it was insignificant the null hypothesis is accepted –that is, a final layoff announcement does not cause a stock price reaction. Hence, this result is also inconsistent with the results provided by the previous studies.

The second hypothesis related to the inter-industry differences and it tested whether stock price reactions differ across the technology, manufacturing, and consumption goods and services industries. The subject was approached by calculating the results to each industry separately and also forming a new portfolio in order to obtain differences in abnormal returns between service-oriented companies and manufacturing companies. The new portfolio consisted of the companies operating in the field of technology as well as the consumption goods and services.

The technology portfolio alone did not provide statistically significant evidence about layoff announcements impact on stock price reaction. The consumption goods and services portfolio provided some support for the matter because the negative daily average abnormal return two days after the event day was statistically significant at level 0.05. The market also reacted during interval [+1,+6]. Statistically significant average abnormal returns occurred two and three days after the announcement day in the manufacturing portfolio. The reaction was positive two days after and negative three days after the event. When observing the differences between the abnormal returns for the service-oriented companies portfolio and the manufacturing portfolio, only weak support was received. Negative average abnormal return is obtained two days after the announcement but only at significance level 0.1. Overall, it can be concluded that there are inter-industry differences and thus the null hypothesis for the second hypothesis is rejected –that is, stock price reactions caused by final layoff announcements are different between industries.

The third hypothesis was about the business cycle aspect and its impact on the stock price reaction. The upturn and downturn periods were defined based on OMX Helsinki

CAP index and two upturn and two downturn periods were observed from the observation period of 2006–2011. First, abnormal returns during the upturn and downturn periods were investigated for each industry alone as well as for the whole sample. After it the differences between the returns of downturn and upturn periods were investigated for the whole sample and for each three industries.

The results for the whole sample were still insignificant after splitting the observations according to business cycles. Even though the previous results were negligible, the differences point out strong evidence that layoffs during the downturn periods are reflected more negatively to stock prices compared to ones given during the upturn periods. For example, the cumulative abnormal returns remain significantly negative starting two days before the event day and lasting until the last observation day. When observing the abnormal returns during the upturn and downturn periods, there are no statistically significant reactions due to layoffs for the technology portfolio. However, the differences in returns reveal that on the announcement day investors react more negatively to announcements given during the downturn periods compared to ones given during the upturn periods. Positive average cumulative abnormal returns occur one day before the announcement.

For the consumption goods and services portfolio, during the upturn periods one significant and negative daily abnormal return existed on day 2 and during the downturn periods a cumulative abnormal return of -1,80 percent occurred after the announcement [+1,+6]. The differences also supported the hypothesis because the negative cumulative abnormal returns occurred on the last four observation days. In the manufacturing portfolio, there were statistically significant abnormal returns during the upturn periods both in daily basis and cumulatively before and after the announcement day. On the other hand, during the downturn periods there were no statistically significant stock price reactions. The differences in reactions, when comparing returns during the downturn periods to returns during the upturn periods, are clear and the results provide strong evidence for the manufacturing portfolio. The differences in the cumulative abnormal returns are statistically significant on every observation day except for the first one and on the event day and after it the difference is -4,50 percent on average. In the light of these results the null hypothesis for the third hypothesis can be rejected based on strong evidence –that is, final layoff announcements given during the economical downturn periods cause more negative stock price reactions compared to ones given during the upturn periods.

All in all, this study provided Finnish evidence about the layoff announcements' impact on stock price reactions. The empirical results were found that both supported the previous studies and also results that differed from the previous studies' findings. It can be concluded that a layoff announcement does not cause a stock price reaction when the whole sample alone is considered but after splitting the observations into industries and furthermore into business cycles a stock price reaction is observed.

This study concentrated in the effect caused by a final layoff announcement. For further research it would be interesting to study whether there are differences in market reactions between the first announcement about the reduction of the workforce -that is, a beginning of a co-determination negotiations- and the final layoff announcement in the Finnish stock market. Also, the differences found between industries may imply that company-specific characteristics affect how investors react to layoff announcements. For example a company size (small versus large companies) and an ownership structure (family-owned versus professionally run companies) could be interesting perspectives to study. Another interesting aspect would be to investigate the post-earnings announcement drift more closely. The differences in returns between the downturn and upturn periods pointed out that the differences stayed statistically significant for six days after the announcement day. The post-announcement's investigation period could be longer in order to research how layoff announcements impact on companies' performance in a long-term.

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APPENDICES

Appendix 1. Companies and stocks used in the study.

Technology portfolio:

Aldata Solution Oyj	ALD1V
Comptel Corporation	CTL1V
Digia Plc	DIG1V
Elektrobit Corporation	EBC1V
F-Secure Corporation	FSC1V
GeoSentric Plc	GEO1V
Nokia Oyj	NOK1V
Okmetic Oyj	OKM1V
Stonesoft Corporation	SFT1V
Tectia Oyj	TEC1V
Tecnotree Corporation	TEM1V
Tieto Corporation	TIE1V
Teleste Corporation	TLT1V
Trainers' House Plc	TRH1V

Manufacturing portfolio:

Aspo Plc	ASU1V
Aspocomp Group Plc	ACG1V
Cargotec Oyj	CGCBV
Cencorp Corporation	CNC1V
Componenta Corporation	CTH1V
Cramo Oyj	CRA1V
Efore Plc	EFO1V
Exel Composites Plc	EXL1V
Finnlines Plc	FLG1S
Glaston Corporation	GLA1V
Huhtamaki Oyj	HUH1V
Incap Corporation	ICP1V
Kemira Oyj	KRA1V
Kesla Oyj	KELAS
Konecranes Plc	KCR1V
Lassila & Tikanoja Plc	LAT1V
Lemminkäinen Corporation	LEM1S
Metso Corporation	MEO1V
Metsä Board Oyj	METSB
Neo Industrial Oyj	NEO1V
Outokumpu Oyj	OUT1V
PKC Group Oyj	PKC1V
Ponsse Oyj	PON1V

Pöyry Plc	POY1V
Ramirent Plc	RMR1V
Rautaruukki Corporation	RTRKS
Raute Corporation	RUTAV
Revenio Group Corporation	REG1V
Ruukki Group Oyj	RUG1V
Stora Enso Oyj	STERV
UPM-Kymmene Corporation	UPM1V
Turvatiimi Corporation	TUT1V
Vaisala Corporation	VAIAS
Wärtsilä Corporation	WRT1V
YIT Corporation	YTY1V

Consumption goods and services portfolio:

Alma Media Corporation	ALN1V
Atria Plc	ATRAV
Finnair Oyj	FIA1S
Fiskars Corporation	FIS1V
HKScan Oyj	HKSAV
Honkarakenne Oyj	HONBS
Ilkka-Yhtyma Oyj	ILK2S
Keskisuomalainen Oyj	KSLAV
Kesko Corporation	KESBV
Lännen Tehtaat Plc	LTE1S
Martela Oyj	MARAS
Marimekko Corporation	MMO1V
Nokian Tyres Plc	NRE1V
Raisio Plc	RAIVV
Suominen Oyj	SUY1V
Talentum Oyj	TTM1V
Tiimari Plc	TII1V

Appendix 2. Average abnormal returns for the service-oriented companies portfolio. Amount of observations N=111.

day (t)	AR	p-statistic for AR	CAAR	p-statistic for CAAR
-4	-0.04%	0.858	-0.04%	0.858
-3	-0.14%	0.928	-0.18%	0.836
-2	0.21%	0.704	0.03%	0.935
-1	0.24%	0.642	0.27%	0.719
0	0.13%	0.522	0.40%	0.477
1	-0.05%	0.672	0.35%	0.815
2	-0.21%	0.848	0.14%	0.877
3	0.10%	0.917	0.24%	0.852
4	0.19%	0.973	0.43%	0.830
5	-0.10%	0.438	0.33%	0.861
6	0.59%	0.492	0.92%	0.886

days [t_1 , t_2]	[-4,-1]	[-1,+1]	[0,0]	[0,+1]	[+1,+6]	[-4,+6]
CAAR	0,27%	0,31%	0,13%	0,07%	0,52%	0,92%
p-stat	0,719	0,830	0,522	0,984	0,725	0,886