SCHOOL OF ECONOMICS AND MANAGEMENT
Lund University

DOES INSIDER TRADING GENERATE ABNORMAL EARNINGS?

- A STUDY OF THE SWEDISH STOCK MARKET -

Supervisor
Göran Anderson

Authors
Henrik Hultenius
Christian Lindros
Michael Sönnerborg

ABSTRACT

Title: Does insider trading generate abnormal earnings?

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Authors: Henrik Hultenius, Christian Lindros and Michael Sönnerborg

Advisor: Göran Anderson

Key words: Insider trading, Event study, Abnormal returns, Swedish Stock Market, Efficient markets

Purpose: The purpose of our study is to find out if insiders in Sweden generate abnormal earnings through insider trades. We want to pinpoint the cause for abnormal earnings by dividing transactions after company market value, size of the trade and type of insider.

Methodology: A quantitative approach using the market model. We have conducted an event study over two short term event windows.

Theoretical
Perspectives: The theoretical perspective can be found in the efficient market hypothesis and signalling hypothesis. Just as important are the previous foreign studies conducted.

Empirical
Foundation: Insider transactions conducted between 2005-01-01 and 2007-10-01 have been studied.

Conclusions: We conclude that insiders in Sweden generate positive abnormal earnings for sales and negative for purchases in our "long" event window. We also have evidence that the abnormal earnings deviate depending on the market value of the company, size of the trade and which type of insider conducting the transactions. We have created a unique matrix combining the categories, which pinpoints exactly which combination that generates abnormal returns.

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1 Introduction

In this introductory chapter our choices and motives behind the research question are presented, which leads up to the purpose of the thesis. First we give a background to the subject and we finish off the chapter with our delimitations and give a short outline of the rest of the thesis.

1.1 Background

Insider trading has long been a discussed subject within the financial industry and the society as a whole. When an insider trade with shares in a company where he/she might be in possession of non-public information, the insider have a notifying duty according to Swedish law. However there are numerous cases where insiders have used information that has not been made public, in order to make money. By doing this insiders can generate higher earnings on their investments in comparison to outside investors. Previous studies by Jaffe in 1974, Finnerty in 1976 and Seyhun in 1998 shows that insiders generate abnormal earnings and that outside investors actually also can receive higher gains by following insider trading. There are also studies made by Cheuk et al in 2006 and Eckbo and Smith in 1998 stating that insiders do not generate abnormal earnings.

According to Swedish law, it is strictly forbidden to trade shares when you possess non-public information that could have an impact on the share price when made public. The law also states that some insiders cannot trade with the share thirty days before the publication of an annual report or an interim report, the day of the publication included.[1] So there is a distinction between legal insider trading, which is not forbidden and illegal insider trading. Normally it is the illegal insider trading that generates major headlines, even though legal insider trading can generate abnormal earnings.

A noticed case in Sweden was when three leading officers of Alfa Laval, including the CEO, Sigge Haraldsson, sold about 50 000 shares six weeks prior to the publication of an interim report. The report was negative and the share price fell and Haraldsson bought back 35 000 shares at the lower price.[2] Soon afterwards the share price rose and by conducting the trades Haraldsson avoided large losses. This trade was allowed according to the Swedish law, however Haraldsson was criticized since he might have had some non-public information about what the report would state. That could have been the case but it is hard for The Swedish National Economic Crimes Bureau to prove. The Alfa Laval trades

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[1] SFS 2007:558 paragraph 15.
[2] Insider in Alfa Laval sold before share-price drop, DI 22/9-04. www.di.se

were investigated by FI, The Swedish Financial Supervisory Authority, without any consequences.

1.2   Problem Discussion

The Swedish National Economic Crimes Bureau is struggling with which information that could potentially impact the share price. The bureau claims that insiders normally can possess non-public share price impacting information about a month before it will be made public. The law states that some insiders are not allowed to trade shares thirty days before the publication of annual statements[3], therefore there might be a gap were insiders can profit on non-public information. The advantage of having exclusive knowledge implies that insiders stand to make abnormal earnings by conducting insider trading. Foreign studies by Seyhun in both 1986 and 1998 have shown that insiders possess an information-advantage in comparison to outside investors and can thereby generate abnormal earnings.

If abnormal earnings for insiders exist on a short term basis, that the legislation tries to prevent, there are signs of market imperfections. The previous studies mentioned in this chapter all prove that insiders can generate abnormal earnings on a short term basis, by legal insider trading. Then what does drive the abnormal performance on the short term basis? This has not been studied in Sweden before and we wish to find out, through this study, if this market imperfection exists and what drives it?

Previous foreign studies of the presence of abnormal earnings for insiders have shown that the percentage of abnormal earnings depends on a number of factors. Studies conducted by Jeng et al in 2003, Cheuk et al in 2006 and Seyhun in 1998 all show that earnings depend on the size of the company. Normally insiders in smaller companies generate larger abnormal earnings than insiders in large companies. The reasoning of why this pattern exists is that insiders in smaller companies have access to more information than insiders in larger companies. Also the liquidity of the share has been pointed out as a factor for larger abnormal earnings for smaller companies.[4]

A factor also pointed out as important is that size of transactions correlates with abnormal earnings. The studies of this factor are inconclusive in their results. The two patterns found are that the larger the transaction, the larger is the abnormal earning, or that the smallest and largest transactions have smaller abnormal earnings than mid-size transactions. The reasons for these results can be found in

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[3] SFS (2000:1087)
[4] Jeng et al (2003), Cheuk et al (2006), Seyhun (1998)

the signalling theory. The perception of the signalling theory is that larger transactions should generate a stronger signal to the market.[5]

The third, and maybe the most interesting, factor is the existence of information-hierarchy depending on position as an insider. An insider with a position close to the operations, have an information advantage against insiders such as unaffiliated major shareholders. The position with the largest possession of information is shown to be the CEO. However even though the CEO has access to more information does not mean that he/she acts upon it. The CEO is the insider that are most scrutinized by analysts and newspapers, which has the effect that the CEO is careful about the timing of transactions. It will create bad publicity if a CEO purchases shares just to gain on a short term basis. So the CEO is not always the insider generating the highest abnormal earnings on a short term basis.[6] A question worth thinking about is whether or not outsiders would generate abnormal earnings by following the actions of insiders. In Sweden it takes maximum five days before the market has full knowledge of an insider transaction. Rozeff & Zaman found in 1988 that outsiders could generate abnormal earnings by mimicking insider behaviour.

In our study we build upon the previous foreign studies by examining the Swedish Stock Market to see whether or not abnormal earnings exist. In 2003 Wahlström conducted a study in Sweden and our study will examine trades conducted after the publication of his study. The Swedish study do not separate insider trades by purchases and sales, which we have every intention of doing, since there might be a significant difference in abnormal earnings. The Swedish study only has the classification of transactions, depending on which list they are traded on. According to the studies of Jeng et al in 2003, Seyhun in 1998, Cheuk et al in 2006 and Lin & Howe in 1990 there are other categorizations that could be done.

We want to see if there is a difference in abnormal earnings based on a number of classifications. The purpose of classifying is to find out which factors that could potentially generate abnormal earnings for insiders in Sweden, on a short term basis. Also worth examining in some cases is if outsiders could generate short-term profits by mimicking insiders.

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[5] Seyhun (1998), Jeng et al (2003)
[6] Jeng et al (2003), Lin & Howe (1990)

1.3   Research Question

Do insiders in Sweden earn abnormal earnings for purchases and sales during the following trading-month after the transaction?

Are significant abnormal earnings generated;

- Depending on the company market value?
- Depending on the size of the trade?
- Depending on who is conducting the trade?

1.4   Purpose and Contribution

The purpose of our study is to see whether or not insiders generate an abnormal return in Swedish stock companies. We wish to find out if insiders generate abnormal returns in the short run. By classifying the insider transactions based on company market value, size of the trade and who is conducting the trade, we wish to pinpoint the factors that may generate abnormal earnings for insiders.

As far as we know there has been no published study of the Swedish Stock Market, doing the classifications of insider transactions to identify the factors that drive abnormal returns. We will also create matrix portfolios to even more thoroughly find out which type of insider, conducting what size of transaction in which company-size that generates abnormal returns. To our knowledge there is no foreign or Swedish study conducting matrix portfolios by combining the three factors used in our study.

1.5   Delimitations

In our study we only examine legal insider trading in companies listed on the Swedish Stock Market. We look at companies listed on Large Cap, Mid Cap and Small Cap under the supervision of OMX rules. The timeframe for our study are trades carried out between 2005-01-01 and 2007-10-01.

1.6 Thesis Outline

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│      2 - Regulations        │
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│   3 – Theoretical Framework │
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│      6 – Conclusion         │
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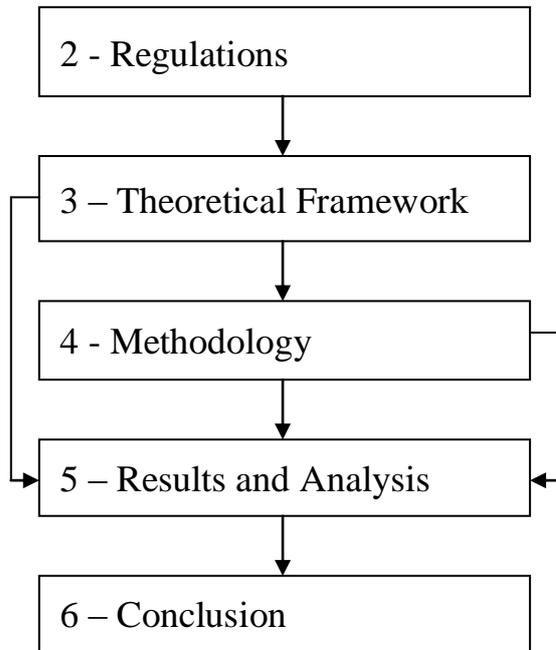
Figure 1.6. Thesis outline.

Chapter 2 gives an overview of the regulations regarding insider trading. Chapter 3 presents the theoretical framework, such as the efficient market hypothesis. In chapter 4 we present our methodology and models used to generate our findings. Chapter 5 is our independent analysis of the data and our empirical findings based on our theoretical framework. The thesis ends with chapter 6, where we present the final conclusions alongside with our suggestions for future studies.

2 Regulations

This second chapter presents the current regulations of insider trading in Sweden. The question of who to be considered as insiders will be answered. The laws concerning insider trading will also be presented, as well as the consequences of breaking the law.

2.1 Introduction

FI, the supervising authority, investigates if insider crimes or illegal share price-effects occur. FI is also supervising and making sure that the companies follow all the applicable laws and regulations. If suspicion of illegal activity arises, FI must turn over the case to the prosecutors.[7] There are two major laws concerning insider crime in Sweden, SFS 2000:1087 and SFS 2005:377. We display the most important parts of both these laws, in relation to our study.

2.1.1 Who Is An Insider?

There is a definition of different insiders in the Swedish law (2000:1087), which was changed the first of November 2007. The definition is as follows:

1. Board-member or substitute in the company, or its parent company.
2. President or Vice President of the company, or its parent company.
3. Accountant or deputy accountant of the company or its parent company.
4. Possessor of another leading position in, or a qualified commission of constant nature to, the company or its parent company, if the position or commission is assumed to be exposed to non-public information that could have an impact on the price of the company´s share.
5. Possessor of position in accordance to 1-3, or possessor of another leading position in a subsidiary, if the position is assumed to be exposed to non-public information that could have an impact on the price of the company´s share.
6. Whoever who owns more than ten percent of either the total market value or ten percent of the total number of votes in the company. This is also applicable if you own the ten percent together with a close person such as wife/husband, co-habitee/co-habitor, or underage children under your custody.

Most of the positions mentioned under item 1-6 can be classified as primary insiders, since they come in contact with non-public information through their

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[7] SFS (2005:377)

jobs. However item 6 describe a secondary insider, which is a person that can receive non-public information through the primary insider. This also means that the secondary insider does not only have to be those mentioned in item 6, but could also be someone else who receives information from the primary insider.[8]

Trading of shares for persons with possession of non-public information about the company is regulated by *SFS 2005:377*[9]*,* which was first introduced 1991 and changed many times after that. This law states that it is forbidden to trade with shares which you have non-public information of. Insider crime is in other words when a person uses information that has not been made public and the information will significantly change the price of the financial instrument[10].

2.2   Trading Ban

If a person is in possession of non-public information that can affect the price of the company´s share, he/she is forbidden to buy or sell shares in the company until the information has been made public, or until the information no longer will have an impact on the share price. A person with this information is not allowed to influence others to trade with the share either. The trading ban is also applicable against legal persons.[11]

2.3   Notifying Duty

A company has an obligation to report which individuals within the organization that have insider-positions and the size of their holding of the company´s financial instruments. An insider has an obligation to notify the changes of his/her holding within five working days, if the trade consists of more than 200 shares or has a market value of more than 50 000 SEK.[12] If an investment bank or an individual broker finds a specific trade as not normal, they have a notifying duty to FI. It occurs that the notification is not made in time which has the legal consequences of a penalty fee of ten percent of the transaction. Insider trading is registered in a public register, which can be found on FI´s homepage since January 2005[13]. The register contains information about who are insiders, which insider-position they have, which financial instruments they own, the size of their holding and the changes in the holding.

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[8] SFS (2000:1087)
[9] The Committee on Justice report, 2000/01: JuU4
[10] SFS (2005:377)
[11] Ibid.
[12] SFS (2000:1087)
[13] http://www.fi.se

2.4   Ban against Short Term Trading

Some individuals with access to non-public information have stringent regulations restricting when they can trade shares of the company. Those included by this ban cannot sell or buy shares thirty days prior to an annual report or an interim period. The day of the publication is included in the thirty days. Those restricted by this short-term ban are those in chapter 2.1.1, item 1-3. This means that other insiders still can trade during this period.[14]

2.5   Consequences of Breaking the Law

Transgression of the law will have legal consequences and if illegal trading can be proven, one can be sentenced to deprivation of freedom and the financial profit of the trade will be seized. The maximum punishment breaking the notifying duty is a penalty fee of 350 000 SEK.[15]

The maximum penalty for using insider information illegally is prison for four years and the minimum penalty is six months. For manipulating market prices in an illegal way, the maximum penalty is prison for two years.[16]

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[14] SFS (2000:1087)
[15] SFS (2005:377)
[16] Ibid.

3   Theoretical Framework

This third chapter presents the different theories that will be used in our analysis of this thesis. This chapter will be the theoretical framework, which is the foundation of our empirical study.

3.1   Efficient Market Hypothesis (EMH)

The efficient market hypothesis claims that share prices always fully reflect all available information and that efficiency is all about information[17]. Access and the market´s ability to quickly adjust the prices, when new information is available, determines the degree of efficiency. Price movements occur in the financial market only due to new information[18] and price movements follow a "random walk"[19]. It is an extreme null hypothesis and the categorization into weak, semi-strong, and strong form serves the purpose of identifying the level of information that rejects the null hypothesis. There is no empirical evidence against the hypothesis in the weak and semi-strong form tests.[20]

There are market conditions that can hinder or help efficient adjustments of prices to new information. Sufficient conditions for a market to be efficient are; (1) There should be no transaction costs in trading securities, (2) all available information should be available to all market participants for free and (3) they should all agree on the implications of current information for the current price and distribution of future prices of each security. If these three conditions are fulfilled, prices fully reflect all available information and the market is efficient. All three exist to some extent and are potential sources of market inefficiencies.[21]

3.1.1   Weak-form Efficiency

In the weak form of efficiency share prices are assumed to reflect all information included in historical share prices[22]. The hypothesis claims that if it is possible to make abnormal returns by collecting and analyzing historical share prices, investors do this and the opportunity are immediately seized and prices adjust accordingly[23]. The weak-form efficient hypothesis does not support any kind of technical analysis, since technical analysis make forecasts based on previous share price patterns.

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[17] Fama (1970)
[18] Ibid.
[19] Samuelson (1965), Mandelbrot (1966)
[20] Fama (1970)
[21] Ibid.
[22] Ibid.
[23] De Ridder (1988) p. 8

3.1.2   Semi-strong Efficiency

The semi-strong market requires prices to reflect not only historical prices, but also all publicly available information[24]. This includes interim reports, proposals of mergers, share splits and similar news[25]. To easily test if the market is semi-strong efficient an event study can be made[26]. If prices efficiently adjust to new information and prices fully reflect all published information, the market is semi-strong efficient[27]. The semi-strong hypothesis state that it is meaningless to analyse publicly available information, as the market has already incorporated it into the share prices. If the price change before the announcement this is a sign of information leakage and illegal insider trading[28].

3.1.3   Strong-form Efficiency

The market is strong-form efficient when prices reflect all available information, even insider information. The strong-form market is adding the rest of the possible information that have an impact on the share price, to the semi-efficient market. When the market is strong not even insiders make abnormal returns by trading on the non public information that they possess. The assumption is that the information distribution is efficient enough to provide relevant information for everybody instantly[29]. The implication of the strong form is that evidence of insiders, or investors capabilities to generate abnormal returns is incompatible with the hypothesis. If the strong-form efficiency apply to the Swedish Stock Market, we do not observe any abnormal returns in our study.

3.2   Signalling Theory

The efficient market hypothesis does not empirically support the strong-form of efficiency[30]. This means that insiders have more information than investors, concluding that there is an information asymmetry in the market. Insiders signal his information through the capital structure of the company and the choice of a managerial incentive schedule or high or low dividends [31].

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[24] De Ridder & Vinell (1999), p. 84.
[25] Fama (1970)
[26] Fama(1991)
[27] Fama (1970)
[28] De Ridder & Vinell (1999) p. 92.
[29] De Ridder & Vinell (1999), p. 84.
[30] Fama (1970)
[31] Ross (1977)

If insiders buy and sell shares in their own company, it generates a signal to investors. An insider who possess non public information and sell shares would be interpreted that the company´s future expected cash-flows are worse than initial forecasts. On the contrary insiders who buy share in the company would give a signal about good future expected cash-flows. In reality investors pay attention to these signals from insiders and try to find some sort of pattern in the behaviour of insiders. Signals of a purchase from an insider is normally considered as a good sign, since the insider more or less could invest in any other financial instrument in the market, but still chooses the own company. It is harder with a sale since there could be different reasons for the sale, such as; if the insider need money for personal reasons, to minimize tax payment by matching profits and losses in the capital market, or the fact that the insider finds better investment possibilities. The last choice should be seen as a trading signal to the stock market.[32] The fact that there is information asymmetry makes it interesting to see if it is possible to follow insider trading, and if this strategy generates abnormal earnings. If not, the Swedish financial market is efficient.

3.3   Previous Studies

There is a large amount of studies covering insider trading. We are going to portray some of the previous studies that cover insider trading and the connection to abnormal earnings. The studies presented are the ones that are most relevant to our study. Most of the studies are conducted in the American market, and yields similar results. Studies conducted in Norway and Hong Kong present results that deviate from the American studies.

3.3.1   Swedish Study

To our knowledge there is only one published article from Sweden about insider trading and abnormal earnings. This was published in 2003 and written by Wahlström. The study cover all data between 2000 until 2002 and contain different classifications. The trades are divided by which list the company is listed on, but surprisingly not by buy or sell. The results of the study are an abnormal earning of approximately 1,26 % on the largest list. For the smaller list there is a negative return for insiders. Wahlström´s focus is however if an outsider makes abnormal earnings by following the insider trades.[33]

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[32] Lynch, Magellan Funds, http://www.insidermonthly.com/insidermonthly.asp?
[33] Wahlström (2003)

The problem with comparing our study with Wahlström´s, is the consolidation that he makes of purchases and sales to one portfolio. This leave a desire of more divided portfolios to distinct earnings from insider purchases and sales. In other words, we cannot draw any conclusion from the Swedish study.

3.3.2 Foreign Studies

A researcher that has conducted two studies in the area is Seyhun. The first study covers if insiders make abnormal earnings from macroeconomic factors or firm specific factors. The study includes approximately 60 000 insider trades between 1975 and 1981 in New York. The study shows that insiders generates 4,3 % abnormal returns for buying and 2,2 % for selling. However if an outsider follows the insider, he/she do not make any abnormal earnings due to transaction costs.[34] Seyhun also make the distinction that insiders from large companies make higher returns due to a better forecasting ability of macroeconomic factors. Insiders from smaller companies yield higher returns due to firm specific factors.[35]

The second study from 1998 is interesting from our perspective. The study starts with the categorization of insider-trading for different insiders, depending on the level of information that they could possess. It is shown that the CEO´s transactions have the highest abnormal returns, and beyond this it proves that the less information an insider possess, the smaller the abnormal returns. The lowest abnormal return is generated by major shareholders. Same study proves that there is a positive correlation between the size of the transaction and the abnormal earnings. The transactions are divided into four groups, depending on the size of the transaction. The group with the smallest transactions generates 0,8 % abnormal return and the group with the largest generates 4,4 %. An important conclusion from this study is that abnormal earnings in relation to the market value of the company are important. The companies with the highest market values have the smallest abnormal return of 1,7 %, while the smallest companies shows 6,2 %.[36] This last statement is strengthened by other studies in the American market[37]. A study of the relation between transaction size and abnormal earnings claimed that the reason for conducting a larger transaction might be different from the smaller transactions. The smaller transactions are made to generate abnormal returns but larger transactions are made to gain power in the company through a larger number of votes.[38].

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[34] Seyhun (1986)
[35] Ibid.
[36] Seyhun (1998)
[37] Pascutti (1996), Lakonishok & Lee (2001)
[38] Jeng et al (2003)

A study with the purpose of analyzing what actually causes abnormal earnings; price changes due to disclosure of non public information or by the news of the insider trades. The study presents evidence that abnormal earnings are normally generated by the news of the insider trades itself, not by the disclosure of information.[39] The study confirms the significance of the signalling hypothesis to insider trading. According to this study an insider does not make abnormal earnings until the publication of the trade is done. Following this study a researcher finds evidence that outsiders do generate abnormal returns by following the transactions of insiders. They make this by conducting transactions upon the point of public notification of the insider trade[40].

In 1998 a study of the Norwegian Stock Market was published, conducted by Eckbo and Smith. The study shows the result of zero or negative abnormal earnings for purchasing transactions. In the thesis the hypothesis of insiders purchasing when the share price is considered low and selling when the share is considered expensive is expressed. However the negative abnormal earnings for purchasing transactions reject the hypothesis. The study finds positive abnormal earnings for sales, according to the market model.[41] Another study from Hong Kong shows that the market in Hong Kong distinguishes from the American market. The study construct portfolios and made the categorize transactions based on company-size. The results of the categorization show that insiders in smaller companies generate larger abnormal returns than insiders in larger companies. This is due to the fact that insiders in smaller companies have a greater overview of relevant non-public information than insiders in large companies. The signalling effect of a transaction in a smaller company is greater than the signal of a trade in a larger company.[42]

Lin and Howe´s study from 1990 shows that there is an information-hierarchy within the company. Insiders close to operations, such as the CEO and other leading officers generate larger abnormal earnings than unaffiliated major shareholders. Another study prove that even though the CEO has an information advantage, he/she does not use it. This do to with the knowledge that the CEO´s trades will be thoroughly investigated by newspapers and analytical firms, and the CEO wishes to avoid negative publicity by earning short term profits. So when the CEO finally trades he/she has the intention of owning the share over a longer period of time[43].

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[39] Givoly & Palmon (1985)
[40] Rozeff & Zaman (1988)
[41] Eckbo & Smith (1998)
[42] Cheuk et al (2006)
[43] Jeng et al (2003)

4 Methodology

In this fourth chapter we give a description of the methodology used to perform our study. We describe how the study is conducted, how data is collected and which problems to overcome for the study to be reliable and valid.

4.1 Event Study

The purpose with this study is to investigate whether or not insiders generate abnormal returns in Swedish stock companies. Conducting the study means that a lot of financial data will be collected, classified and analysed. The preferable method for this type of study is a quantitative method[44].

In our study we have use an event study, which is a common method of quantitative studies. The event study is suitable, since the primary use of an event study is to measure the impact of financial events, such as insider trading. The primary advantage of using an event study, given an efficient market, is that when an event occurs it will immediately affect share prices.[45]

The event study has a long history of usage, since the first study was conducted and published by Dolly in 1933. Dolly used the event study to examine nominal price effects on share splits. Since Dolly´s study, the methodology of the event study has experienced a number of improvements. The methodology used today is essentially the same as the methods presented in the late 1960s by Ball & Brown in 1968 and Fama et al in 1969.[46] The two main changes in methodology since the 1960s[47], are that event studies today mostly uses daily returns instead of monthly, and the second is the improvement of the methods for calculating the abnormal returns.[48]

Even though there are improvements of the event study, there is still criticism towards the method. The primary criticism is based on the fact that the method can capture effects from other events that occur during the event window. For further details about the criticism towards event studies and the reliability and validity of our study, see chapter 4.9.

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[44] Holme & Solvang (1997) p. 80
[45] MacKinlay (1997)
[46] Ibid.
[47] Brown & Warner (1980,1985)
[48] Kothari & Warner (2006)

4.1.1   Procedure of the Event Study

The procedure for performing an event study has no unique structure. There is a general structure for conducting the analysis, which consists of seven steps.[49]

1. Definition of Event
   The event study is initiated by defining the event that is going to be studied, and the time period during which the effects of the event will be examined – *the event window.* In our study we investigate whether insiders generate abnormal returns, or not, in the Swedish Stock Market and the defined events are their buy and sell transactions. Further details about the event window can be seen in chapter 4.6.

2. Selection Criterion
   The second step is to determine the basis for selecting the companies we examine. The selection criterion can for example be companies in a certain industry or listed at a certain stock exchange. In our study we investigate the companies listed on Large Cap, Mid Cap and Small Cap at the Stockholm Stock Exchange. A further criterion for the selection is that the company has been listed during the whole time period of the study. Further details about our selection and how we divide the companies into different portfolios can be seen in chapter 4.2.

3. Normal and Abnormal Returns
   In order to conduct an appraisal of how the share price is affected by the event, a measure of the abnormal return is required. The abnormal return for a time period is computed by taking the actual return and subtracting the normal return for the period. The normal return in this case is defined by the share´s expected return, if the event would not have occurred.

4. Define Estimation Procedure
   To calculate the abnormal return the expected return has to be known. The expected return can be determined by using one of several methods available. Further details of our choice of the market model can be seen in chapter 4.7.3. The market model uses an estimation window, which is the period prior to the event window, in order to estimate the expected return.

5. Define testing framework
   In this step we have to define the statistical tests that must be conducted in order to reject or verify the significance of the transactions. Usually the

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[49] MacKinlay (1997)

data from single events are aggregated before the statistical test can be carried out. Other important parts in this step are to define the null hypothesis and determine the method for aggregating abnormal returns.

6. Results

When the statistical tests are conducted and the hypotheses are either rejected or confirmed the empirical result is presented. In studies when only a minor number of events are tested and analysed, it is important to consider that a specific event can influence the entire result.

7. Analysis and Conclusions

As the final part of the event study an analysis of the results will ideally lead to insight helping us to interpret the results of the event study. Thereafter a conclusion of the analysis completes the study.

4.2   Selected Events

Selected events in our study are transactions made by insiders on Stockholm Stock Exchange. We examine companies listed on Large Cap, Mid Cap and Small Cap. We gather data describing the transactions, and thereafter divide it into different portfolios which we present in chapter 4.2.1 - 4.2.4. For further details about the gathering of data, see chapter 4.5.

4.2.1   Buy and Sell Portfolios

First we make the overall distinction between buy and sell transactions, presented in table 4.2.1. The distinction between buy and sell transactions apply in most studies, for example studies made by Seyhun in 1998, Jeng et al in 2003 and Eckbo & Smith in 1998. The previous study in the Swedish Stock Market, by Wahlström in 2003, does not make this distinction. We want to test the hypothesis claiming that insiders purchase shares at low prices and sell at high prices, formulated by Eckbo & Smith in 1998. We use exactly the same subcategories within the buy and sell portfolios, in order to be consistent.

YEAR	BUY	SELL	TOTAL
2005	618	561	1179
2006	781	639	1420
2007	835	429	1264
TOTAL	2234	1629	3863

Table 4.2.1. Number of insider transactions by year and type.

4.2.2   Category 1: Company Market Value

We wish to find out if there is a difference in the abnormal earnings depending on the market value of the company. Previous studies are inconclusive on the subject, but most of the studies concerning company-size prove that insiders in small companies generate higher abnormal earnings than in large companies.[50] A study proves that insiders in small companies generate abnormal returns for purchases but no abnormal returns for sales.[51] Since the studies are inconclusive we wish to investigate the situation in the Swedish Stock Market. We divide the transactions based on market value of the company, at the time of the transaction, which we gather from Datastream. We use three different categories; Large (value of more than 10 billion SEK), Mid (value of 1,5 – 10 billion SEK) and Small (value below 1,5 billion SEK). In table 2 we present the number of transactions divided by company market value. Our categorisation follows the market value of Stockholm Stock Exchange.

COMPANY SIZE	BUY	SELL	TOTAL
LARGE	746	384	1130
MID	627	604	1231
SMALL	861	641	1502
TOTAL	2234	1629	3863

Table 4.2.2. Number of insider transactions by type and company size.

4.2.3   Category 2: Size of the Trade

In order to examine if an insider makes abnormal returns, based on the size of the transaction, we categorize the transactions by size. The largest transactions are often noticed by the media, and we do believe that there is a difference in abnormal earnings depending on the size of the transaction. Previous studies prove the correlation of transaction size and abnormal earnings. We find two patterns, one claiming that the largest transactions have the largest abnormal earnings and the other claiming that mid size transactions have the largest abnormal earnings.[52] Since the studies are inconclusive we wish to find out which patterns that could be found in the Swedish Stock Market. We have four categories based on transaction-size; A (50 000 – 200 000 SEK), B (200 000 SEK – 2 million SEK), C (2 million SEK – 10 million SEK) and finally D (larger than 10 million SEK).

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[50] Seyhun (1998), Lakonish & Lee (2001)
[51] Jeng et al (2003)
[52] Jeng et al (2003), Seyhun (1998)

TRANSACTION SIZE	BUY	SELL	TOTAL
A	905	324	1229
B	939	807	1746
C	241	349	590
D	149	149	298
TOTAL	2234	1629	3863

Table 4.2.3. Number of insider transactions based on type and transaction size.

4.2.4 Category 3: Who Is Conducting the Trade

Some insider types possess exclusive information and can in theory make more abnormal earnings than other types of insiders, based on this information. Studies made in this area prove that insiders who possess more information earn larger abnormal earnings.[53] An interesting statement is that the CEO might not always conduct insider transactions to gain abnormal earnings in the short run, due to negative publicity following such an event.[54]

We believe that the CEO is the insider that posses more information than other insiders since he/she is responsible for operations. Another insider we study is the major shareholder. We believe that the result of the major shareholder is hard to forecast since major shareholders could be unaffiliated and not know much more than the market. Or in contrary, be active and possess much information, in order to avoid large losses by trusting the CEO. Every other insider that is not a CEO or a major shareholder will be categorized as an ordinary insider.

INSIDER TYPE	BUY	SELL	TOTAL
CEO	287	112	399
M. SHAREHOLD	242	251	493
OTHER	1705	1266	2971
TOTAL	2234	1629	3863

Table 4.2.4. Number of insider transactions based on type and type of insider.

4.3 Historical Share Prices

For every company included in our study we gather historical share prices from Datastream. We do need data to estimate the parameters used in the market model and some transactions at the far end of the transaction data set force us to use data beyond the transaction data range. We gather the adjusted historical prices from 2004-01-01 to 2007-10-30. The adjusted historical prices force us to adjust the size of the trade for splits and dividends, for the companies included in our study.

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[53] Seyhun (1986 ,1998)
[54] Lin & Howe (1990)

4.4   Index Values

In order to estimate the parameters in the market model we have to know the index value over the relevant period. We use Datastream by Thomson Financial to retrieve the data needed. The full range of the index values we use is 2004-01-01 to 2007-10-30.

We use the OMX Stockholm All-Share Index (OMXS) that includes all companies listed in the Nordic Exchange in Stockholm. This index is the most appropriate to match with the companies used in this study. The reason for using OMX All-Share Index is that our study include approximately the transactions of two thirds of the companies listed in the Stockholm Stock Exchange.
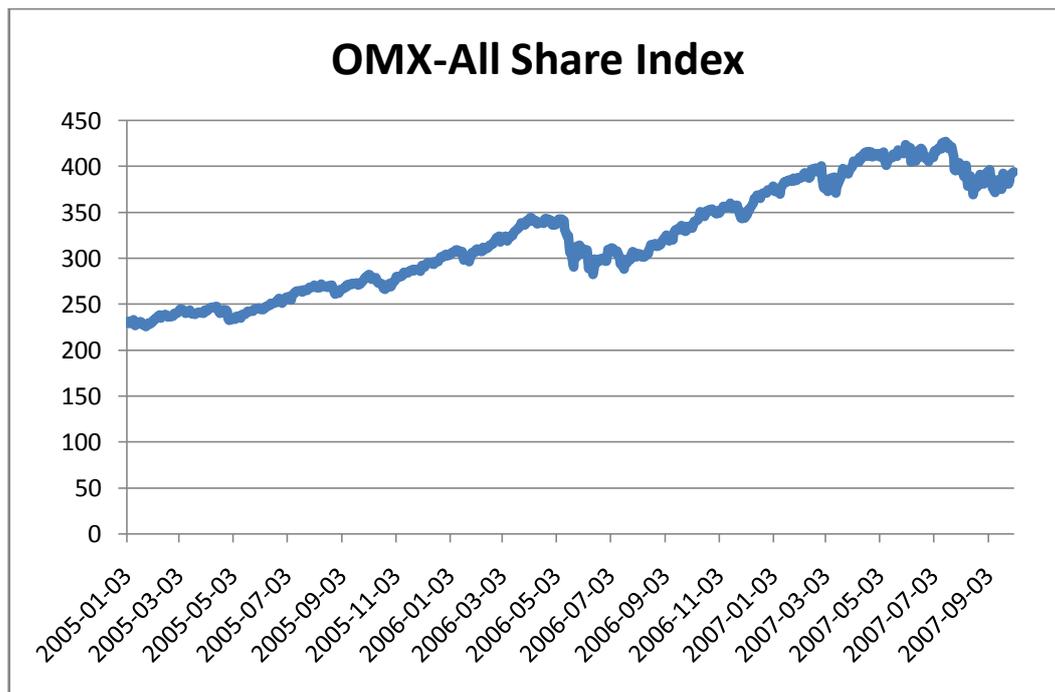
Table 4.4. OMX- All share index

4.5   Gathering of Data and Literature

The source of transaction data is the official register of insider trades maintained by FI. This is the register which insiders are obliged by law to report their transactions to, and is made public by FI through their homepage.[55] We received the data from FI in Excel format in order to easily adapt the data to our study[56].

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[55] http://www.fi.se
[56] Mats Nilsson

The received data consist of all the companies listed on Large Cap, Mid Cap and Small Cap on the Stockholm Stock Exchange. Not all transactions are relevant to our study, so we filter the data in several ways. First we exclude the companies that do not have enough data, to estimate the parameters used in the market model. Finally we filter the data from transactions not relevant to our study, such as derivatives and subscriptions, and then we adapt the remaining transactions to the current law by removing transactions worth less than 50 000 SEK.

The number of companies affected by our filtering will not have a statistical impact on our study, since our study includes 216 companies and only a few were removed. It is reasonable to believe that the companies and transactions removed were a random sample from the population as a whole, and henceforth we make no statistical corrections for the excluded transactions. The companies included in our study can be seen in the appendix.

The literature used in our study consists almost exclusively of published articles by well known economic and statistical researchers. The articles are mainly gathered from ELIN, the electronic library information navigator of Lund University. In order to retrieve the articles we use keywords such as; insider trading, abnormal return and market model. In order to find other relevant articles we used the reference list of articles that could be used with our purpose.

4.6 Event and Estimation Window

For every transaction an event- and estimation window is created. The event day, the day that the insider transaction occurs, is defined by $\tau = 0$. Further on the event window is defined as $\tau = T_1 + 1$ to $\tau = T_2$, and the estimation window as $\tau = T_0 + 1$ to $\tau = T_1$.[57]
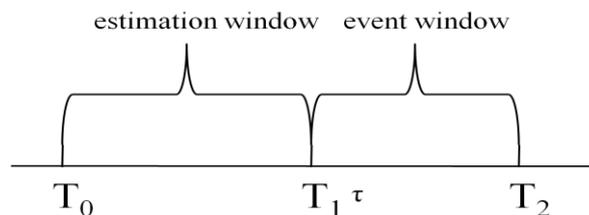

Figure 4.6 Time line for an event study

The event window is used in order to capture abnormal returns during the days surrounding the event. An event window mostly consists of more days than the

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[57] MacKinlay (1997)

event day, and previous studies use a various number of days, depending on the purpose of the study.[58]

In our study we use two different event windows. The first event window consists of the days $\tau = 0$ to $\tau = \tau +5$, and for this window we will further use the term "short window". The second window consists the days $\tau = 0$ to $\tau = \tau + 21$, and for this window we use the term "long window". In total the short window consists of 6 trading days and the long window of 22 trading days.

Our windows can be considered as short, and the reason for using short windows is that a long horizon test is less reliable, due to biases. Therefore, using a short horizon test, our results are more reliable.[59]

The reason for using our "short window" is that it takes up to five days before the transactions are registered at FI´s homepage and thereby made public, see chapter 2.3. By using the short window we examine if there is any leakage of information prior to the publication of the transaction[60]. We use the short window to examine if insiders are able to generate abnormal earnings between the transaction and publication.

We also use a window of 21 days following the transaction, since 21 trading days is the average number of trading days in a month[61] and we wish to observe the short term abnormal returns by insiders. The law states that some insiders are prohibited to trade 30 days before the publication of an interim report, which we mention in chapter 2.4. Within the long event window we can observe the market reaction to the transaction and how quickly the price correction occurs.

For the estimation window we use an estimation period of 150 days $\tau = \tau$-151 to $\tau = \tau$ -1, to estimate $\hat{\alpha}_i$ and $\widehat{\beta}_i$. Previous studies show that the length of the estimation window is not of major importance, as long as it is long enough to estimate the parameters accurately, but at the same time short enough to avoid instability[62]. Estimation windows in previous studies are between 250 and 120 days[63]. What is of more importance is that the estimation window and the event window do not overlap, so the estimation parameters do not affect the returns in the event window[64].

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[58] MacKinlay (1997)
[59] Kothari & Warner (2006)
[60] De Ridder & Vinell (1990) p. 91
[61] Jeng et al (2003)
[62] Dodd (1980)
[63] Dyckman et al (1984), MacKinlay (1997)
[64] MacKinlay (1997)

4.7   Calculating Returns

While performing the study, we conduct a lot of calculations and estimations of our transaction data, in order to retrieve our result. We use Microsoft Excel for our calculations, to obtain the returns for our different portfolios. The formulas we use in our calculations are presented in chapter 4.7.1 to 4.7.6.

We ignore the cost of trading when calculating our abnormal returns. We do this because transaction costs differ between different investment banks. Of more importance is that transaction costs today are small and hardly affect our results. Fama chooses to overlook transaction costs in his study about efficient capital markets in 1991.

4.7.1   Abnormal Returns

The abnormal return for share i at time τ is calculated by subtracting the actual return of share i at time τ with the normal return of share i at time τ. The equation for the abnormal return, according to the market model, can be seen in formula 4.7.1.[65]

$$AR_{i,\tau} = R_{i,\tau} - E\left(R_{i,\tau}\right)$$
Formula 4.7.1. Abnormal return

4.7.2   Actual Returns

To calculate the actual returns for each share and the index we use logarithmic returns in our calculations. By using the natural logarithmic for calculating returns, we avoid arithmetic anomalies that can occur when using simple percentage changes. When testing the hypotheses, the returns calculated by the natural logarithmic appears to have a greater possibility for normal distribution[66].

$$R_{i,\tau} = ln\left[\frac{P_{i,\tau}}{P_{i,\tau-1}}\right]$$
Formula 4.7.2 Actual return

In formula $P_{i,\tau}$ is the price of share/Index i at time τ.

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[65] MacKinlay (1997)
[66] Strong (1992), Wells (2004)

4.7.3   The Market Model

Estimating the normal return of a share can be made using a number of models. There are statistical models like the mean return model and the market model, or economical methods like CAPM.[67]

In our study, we use the market model to estimate the normal return. Even though the market model is a single factor model, previous studies prove that the market model is the most suitable method for estimating accurate abnormal returns[68]. Using a multifactor model, which includes additional factors like industry indexes, usually do not influence the result of an event study. The reason for this is because the additional factors only have limited explanatory power and the abnormal return is similar to the ones of the market model[69]. The usage of CAPM has been criticized for not being accurate in our type of study, because it can be sensitive to restrictions imposed by CAPM, which is based on specific assumptions, for example a perfect market without transactions cost, taxes and unlimited borrow to a risk free rate[70]. According to this evidence, and the fact that it has been used in a number of studies similar to ours[71], we find it suitable to use the market model.

The market model is a statistical model that relates the return of a specific share to the return of the market portfolio[72].

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

$$\text{E}(\varepsilon_{i,t}) = 0 \qquad \text{Var}(\varepsilon_{i,t}) = (\sigma^2_{\varepsilon_{i,t}})$$

Formula 4.7.3 The market model

$R_{i,t}$ is the return of share i at time t, and $R_{m,t}$ is the return of the market portfolio m at time t. $\varepsilon_{i,t}$ is a mean disturbance term with an expected value of zero. α_i and β_i are the parameters of the model.

The strength of the market model is that it eliminates biases caused by fluctuations in the return of the market portfolio. This means that the variance of the abnormal returns decrease. Reducing the variance of the abnormal return will create a greater possibility of identifying effects of the occurred events.[73]

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[67] MacKinlay (1997)
[68] Dyckman et al. (1984)
[69] MacKinlay (1997), Brown & Warner (1980)
[70] Fama & French (1996), MacKinlay (1997)
[71] Seyhun (1986,1998), Wahlström (2003), Cheuk et al (2005)
[72] MacKinlay (1997)
[73] Ibid.

4.7.4　　Normal Return

To define the abnormal return, the actual return has to be compared with a comparison index, in this case the normal return. This means that in order to perform the comparison, a model that can generate the shares normal return has to be specified[74].

$$E(R_{i,\tau}) = \hat{\alpha}_i + \hat{\beta}_i R_{m,\tau}$$

Formula 4.7.4a. Normal return

In order to calculate the normal return, the parameters $\hat{\alpha}_i$ and $\hat{\beta}_i$ has to be estimated. The parameters are estimated through ordinary least square estimation, according to formulas 4.7.4b and 4.7.4c.[75]

$$\hat{\beta}_i = \frac{\sum_{\tau=T_0+1}^{T_1}(R_{i,\tau} - \bar{R}_i)(R_{i,\tau} - \bar{R}_m)}{\sum_{\tau=T_0+1}^{T_1}(R_{m,\tau} - \bar{R}_m)^2}$$

Formula 4.7.4b. Calculation of Beta

$$\hat{\alpha}_i = \bar{R}_i - \hat{\beta}_i \bar{R}_m$$

Formula 4.7.4c. Calculation of Alpha

Where $\bar{R}_i$ and $\bar{R}_m$ are mean values of the return of share i and the market portfolio $m\text{'}s$ return during the estimation window.

4.7.5　　Cumulative Abnormal Return

When the abnormal returns are calculated, the next step is to calculate the cumulative abnormal return (CAR) for each transaction i at time τ. $CAR_{i,\tau}$ is calculated for each day during the event window and aggregates the abnormal return for every day over the event window.[76] $CAR_{i,\tau}$ is also used in the T-test in chapter 4.8.2.

$$CAR_{i,\tau} = \sum_{\tau=T_1+1}^{T_2} AR_{i,\tau}$$

Formula 4.7.5 Cumulative abnormal return

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[74] MacKinlay (1997)
[75] Ibid.
[76] Ibid.

4.7.6   Cumulative Average Abnormal Return

In order to acquire the total average abnormal effect of all the insider transactions in a certain portfolio, we have to calculate the cumulative average abnormal return (CAAR). To calculate $CAAR_\tau$, each $CAR_{i,\tau}$ for the transactions in a certain portfolio during the event window are summarized, and then divided with the total amount of transactions.[77]

$$CAAR_\tau = \frac{1}{N} \sum_{\tau=T_1+1}^{T_2} CAR_{i,\tau}$$

Formula 4.7.6 Cumulative average abnormal return (CAAR)

4.8   Statistical Analysis

To be able to test the significance of the abnormal returns we conduct several tests of our data. The first test that we conduct is the normality test designed by Anderson-Darling, followed by either a parametric or nonparametric test of significance. We conduct the tests to provide a higher reliability for our results.

4.8.1   Normality test

There are numerous ways of conducting a normality test and the choices we are facing are whether to use the Anderson-Darling or the Kolmogorov-Smirnov tests. The most common test used for this type of studies is the Anderson-Darling test. Kolmogorov-Smirnov are more effective when the sample size is larger than 200 and the Anderson-Darling is more effective on smaller sample sizes.[78]

Anderson-Darling is a model that can be calculated using statistical software such as Minitab, which is used by us. In Minitab we conduct a hypothesis test to observe whether or not the specific portfolio is normally distributed. The hypotheses we use are:

H_0: *The data within the portfolio follow a normal distribution.*
H_1: *The data within the portfolio do not follow a normal distribution.*

The decision making process of the normality test will be based on the given probability value (p-value). If the p-value is less than, or equal, to our choice of

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[77] MacKinlay (1997)
[78] Stephens (1974)

significance, also called α-value, the null hypothesis is rejected and we claim support of the opposite hypothesis. Our α-value is the commonly used 0,05 as the critical value, recommended by statistical literature[79].

Hypothesis testing can result in either rejecting or accepting the null hypothesis (H_0). However, since the null hypothesis is either true or false, hypothesis testing can generate two types of errors; Type I error, which means that we reject a correct null hypothesis. Type II error means that we accept an incorrect null hypothesis. The probability of these errors is called α and β. Consequently the α-value is the significance of the hypothesis test.[80]

Once the normality test has been conducted take into consideration if we want to use a parametric or nonparametric test of significance. Generally, nonparametric tests require less strict assumptions but use less of the information embedded in the data. As a result nonparametric tests can be less powerful than parametric tests when the assumptions of the parametric tests are met.[81] It has been shown through different studies that both of these test has advantages. The conclusion that can be drawn from these studies is that the T-test should be used when the samples in the test are normally distributed.[82] When the data is not normally distributed the nonparametric test should be used. We use the Wilcoxon test, mentioned in studies previously done about test statistics.[83]

4.8.2   T-test

Student´s T-test can be used when the data is normally distributed. The formula used is presented in formula 4.8.2a[84]:

$$t = \frac{CAAR_{i,t}}{\left(\hat{S}_{CAAR_{t}} \middle/ \sqrt{N}\right)}$$

Formula 4.8.2a Student´s T-test

Where N is equal to the number of days in the estimation window, $\tau = \tau$ -151 to τ = τ -1. $CAAR_{i,\tau}$ is CAAR for each day τ in the estimation window. $\hat{S}_{CAAR_{t}}$ is an approximation of the standard deviation of the portfolio calculated as stated in formula 4.8.2b[85]:

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[79] Körner & Wahlgren (2006) p. 208
[80] Körner & Wahlgren (2006) p. 200
[81] Gujarati (2003)
[82] Brown & Warner (1980,1985), Berry et al (1990)
[83] Thompson & Zivney (1989)
[84] Körner & Wahlgren (2006), p. 210
[85] Körner & Wahlgren (2006), p. 80

$$\hat{S}_{CAAR_\tau} = \sqrt{\frac{\sum_{\tau=T_0+1}^{T_1}(CAR_{i,\tau} - CAAR_\tau)^2}{N-1}}$$

Formula 4.8.2b Approximation of standard deviation

To test the significance of the findings in our study we are using a non directional hypothesis test. This means that we are using a two sided test with a five percent significance level to test for positive or negative abnormal returns. The reason for using a nondirectional hypothesis is that we do not know the results in advance and we do not want to rule out any results by using only a one sided test. The hypotheses used in both our T-test and Wilcoxon test are as follows:

H_0: Insiders do not earn any significant abnormal earnings conducting transactions
H_1: Insiders do earn any significant abnormal earnings conducting transactions

For the T-test we will present the t-value as well as the p-value in our tables in chapter 5.

4.8.3   Wilcoxon

Wilcoxon is a test of the symmetry of data used to find out if the null hypothesis will be rejected for a population that is not normally distributed. It is a signed rank test and it is calculated in Minitab. We are using the exact same hypotheses of abnormal returns and the exact same α-value as the T-test. The formula for Wilcoxon is stated in formula 4.9.3[86]:

$$Z_W = \frac{\left\{W\frac{n(n+1)}{4}\right\} - 0,5}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}$$

Formula 4.8.3 Wilcoxon test

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[86] Johnson & Mizoguchi (1978)

4.9 Reliability and Validity

In order to be able to make accurate conclusions from our research, it is important that the information in our study both valid and reliable. The reliability of our study depends on how accurate we are in the process of managing our data. The validity depends on if we measure what we are supposed to measure, that is; our research question[87].

Human error in the extensive data handling process will undermine the reliability and can lead to misleading results. Through our continuous accuracy and carefulness when building the database through macros in Excel, we minimize human errors. Data have been gathered from FI and Datastream. Since FI is a supervising authority, with the mission of gathering transaction data, we find the data received from them as reliable. The historical share prices and index values gathered from Datastream are seen as reliable, since Datastream is a trusted source of historical financial data. The previous studies used are mainly gathered from ELIN, the electronic library information navigator of Lund University. This is a trusted source of published articles in journals that thoroughly examines the articles that is published. Since we conduct tests statistics to our results, our sources of information are reliable and that we are accurate managing our data, we state that our information obtains a satisfactory degree of reliability.

In order to measure what we are intended to do, and obtain as much valid information as possible, we have utilized the event study methodology. It is central for measuring abnormal share return[88], frequently applied in financial research[89] and easily used when the effect of an economic event is to be measured[90]. One implication with event studies is that they also capture external events that we are not intended to measure, which influence the validity of our results. With external events we mean the announcements of non firm specific information which has an impact on the value of the company. This are for example changes in oil prices, monetary policy changes, terror threats and other macroeconomic changes[91]. When using a short event window, we minimize the risk of incorporating such biases into our research. Accordingly, in order to increase the validity we have chosen event windows not longer than necessary.

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[87] Holme & Solvang (1997) p. 163
[88] MacKinlay (1997)
[89] Fama (1991), MacKinlay (1997)
[90] MacKinlay (1997)
[91] Wells (2004)

5 Results and Analysis

In this chapter we will present the empirical findings of our study. We will present tables over our results based on the different portfolios. We will also analyse and discuss our findings with the help of our theoretical framework.

5.1 Presenting Our Findings

The results from our findings are presented in tables divided by our three categories, as well as the overall buy- and sell portfolios. Within the tables our event windows are presented as short ($\tau = 0$ to $\tau = \tau +5$) and long ($\tau = 0$ to $\tau = \tau +21$). The short event window consists of 6 trading days and the long event window consists of 22 trading days. The hypotheses are the same for every single portfolio created:

H_0: *Insiders do not earn any significant abnormal earnings conducting transactions*
H_1: *Insiders do earn any significant abnormal earnings conducting transactions*

Significant results that reject the null hypothesis are shown in bold style within the tables. Depending on whether or not the portfolio samples are normally distributed, we use either T-test or Wilcoxon´s test. When the normality value is below 0,05 the data is not normally distributed and if above 0,05 the data is normally distributed. When the normality test shows that the data is not normally distributed we use the Wilcoxon test, and the T-test when the α-value is above 0,05. Worth noticing is that CAAR for sell transactions is presented as insiders avoiding losses, which means that when the CAAR is positive, the share prices have underperformed in relation to expected returns.

5.2 Buy and Sell

Findings:

Transaction Type	Event Window	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	SHORT	**0,332 %**	>0,05	-4,98	**0,001**	0,005
BUY	LONG	**-0,546 %**	>0,05	-8,34	**0,000**	0,000
SELL	SHORT	**0,723 %**	>0,05	-2,47	**0,033**	0,056
SELL	LONG	**3,275 %**	<0,05	4,48	0,000	**0,001**

Table 5.2 Findings for Buy and Sell portfolios.

Both the short and long portfolio for buy and sell transactions generate a significant result since the p-values from the T-test and Wilcoxon are below our α-value. From the normality test we find that the long sell portfolio is not normally distributed. The other three portfolios on the other hand are, hence why we use the T-test for them.

A large number of previous studies of insider transactions, are made in the American market and most of these studies have shown that insiders generate abnormal returns[92]. However studies conducted in other markets, such as Hong Kong[93] and Oslo[94] show results that differ from the American studies. The conclusion of the Hong Kong study is that a sell transaction is seen as a stronger signal, since sales occurs far less than purchases in that market. We cannot make the same conclusion in Sweden since the difference is not that large between the number of sales and purchases. What can be seen is that the empirical evidence of the hypothesis of insiders purchasing low and selling high is rejected. We have evidence claiming that insiders also purchase high, just as the study made in Oslo[95].

Since transactions that deviate from normal in size are thoroughly investigated by newspapers and FI, insiders might not want to act upon information that can generate abnormal earnings. Insiders fear this kind of attention and can therefore purchase to own the shares over a longer period of time than one month. This conclusion is the same as the one used by Rozeff & Zaman in 1988. We know that if an insider purchases shares, it should be seen as an investment. The insider can in fact choose from a number of investments, but still invests in his/her own company. The only other reason for an insider to purchase shares is to increase his/her influence in the company. These transactions are larger than normal and widely publicized when they occur.

The results we found for insider sales of an abnormal return of 3,275 % over the long event window are in comparison to the results of Cheuk et al in Hong Kong[96]. The Oslo study generate the result of negative abnormal earnings for purchases, just as our long window of -0,55 %, and abnormal returns of roughly the same percentage as us for sales during the following month of the event[97]. This study is important as a benchmark to us, since the Norwegian and Swedish markets are similar. One possible explanation of the abnormal earnings for sales is that insiders do not have the same fear to be investigated. Insiders know that there

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[92] Jaffe (1974), Finnerty (1976), Seyhun (1986,1998) and Jeng et al (2003)
[93] Cheuk et al (2006)
[94] Eckbo & Smith (1998)
[95] Ibid.
[96] Cheuk et al (2006)
[97] Eckbo & Smith (1998)

can be many more reasons for selling shares than buying. If question arises whether the insider sell to avoid losses based on non-public information or not, the insider can always claim another reason for selling. This was the case when the Alfa Laval story was examined. The insider claimed that he had sold to invest in something else[98].

The results of the shorter event windows are rather small and indicate that there is no leakage about insider transactions to the market. Eventually when the trades are made public, which occur no later than five days after the trade, we can observe some signalling effects. The results found in our study imply that an outsider in fact make a loss of approximately 0,9 % at the end of the long event window, if he/she purchases shares when information about the insiders purchase are made public by FI. On the other hand if an outsider would sell shares when an insider sale are made public, he/she will gain about 2,5 %. These percentages are just an approximation by taking the CAAR of the long event window and subtracting the CAAR of the short window.
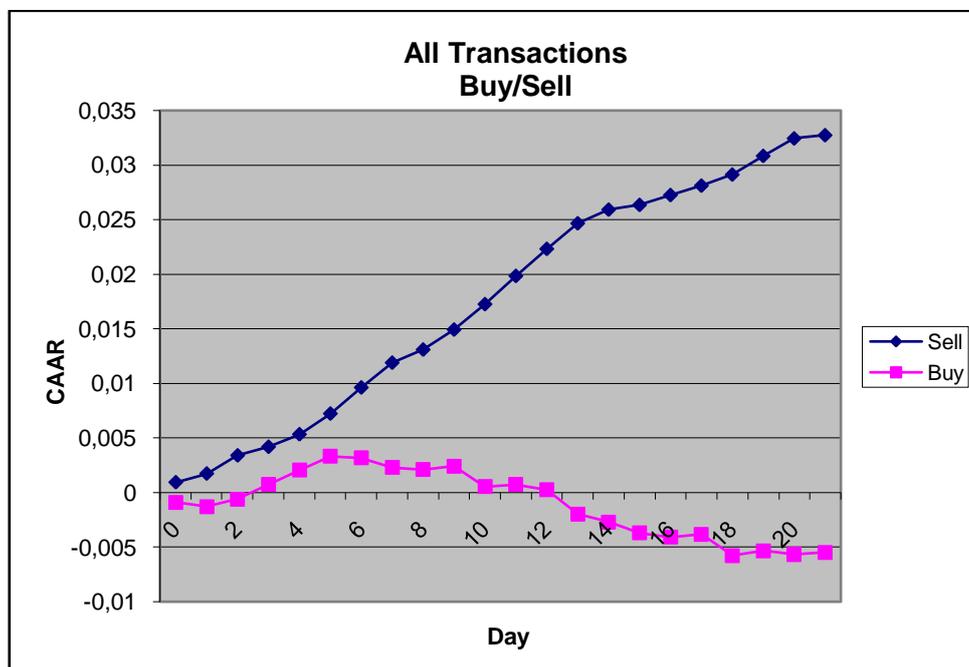
Diagram 5.2. Buy and sell portfolios

In diagram 5.2 we see the development of the CAAR for every day in the event windows. The largest portion of the abnormal returns is generated after the publication of the trade. This development is normal in comparison to previous studies.[99] We see the gap between mimicking purchases and sales, which is 3,75 % in day τ+21.

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[98] Insider in Alfa Laval sold before share-price drop, DI 22/9-04. www.di.se
[99] Jeng et al (2003), Lakonishok & Lee (2001), Cheuk et al (2006)

5.3   Company Market Value

Findings:

Transaction Type	Event Window	Company Size	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	SHORT	LARGE	-0,355%	>0,05	-1,89	0,088	0,142
BUY	LONG	LARGE	**-1,840%**	<0,05	-5,76	0,000	**0,000**
BUY	SHORT	MID	**-0,128%**	<0,05	-6,10	0,000	**0,004**
BUY	LONG	MID	**-1,307%**	<0,05	-12,53	0,000	**0,000**
BUY	SHORT	SMALL	1,268%	>0,05	0,910	0,382	0,689
BUY	LONG	SMALL	**1,134%**	<0,05	6,300	0,000	**0,000**
SELL	SHORT	LARGE	0,618%	>0,05	0,860	0,411	0,266
SELL	LONG	LARGE	**2,163%**	<0,05	5,280	0,000	**0,000**
SELL	SHORT	MID	0,834%	>0,05	1,200	0,260	0,505
SELL	LONG	MID	**2,903%**	<0,05	5,900	0,000	**0,000**
SELL	SHORT	SMALL	**0,681%**	>0,05	-4,450	**0,001**	0,009
SELL	LONG	SMALL	**4,292%**	<0,05	3,190	0,004	**0,016**

Table 5.3 Findings for type and size of the company.

For the twelve different portfolios in table 5.3 we find eight portfolios with significant results. The four portfolios accepting the null hypothesis are all short event windows, two of them for sales and two of them for purchases.

As shown in table 5.3 the only insiders that generate abnormal returns for purchases are the ones in smaller companies. This result is in line with many previous studies.[100] The results of *small* confirm that our intuition is correct; in small companies, it is easier for an insider to have a broader overview of operations, thereby owning more exclusive information. Smaller companies also receive less attention from analysts and newspapers, which means that insiders do not have the same fear of being examined about their insider transactions.

The results of insider purchases in *mid* and *large* show negative abnormal earnings. As already stated insiders in larger companies normally purchase shares to own them over a longer period of time, and are careful of purchasing when they could stand to gain abnormal earnings over a shorter timeframe.[101] If outsiders follow insiders at the point of publication, which normally is when the short event window ends (maximum 5 trading days after the transaction[102]), outsiders will not generate abnormal returns for any of the three company sizes. In diagram 5.3a we illustrate the development of the purchasing categories divided by company size.

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[100] Rozeff & Zaman (1988), Jeng et al (2003), Seyhun (1986, 1998), Lakonishok & Lee (2001), Cheuk et al (2006)
[101] Jeng et al (2003)
[102] SFS (2000:1087)
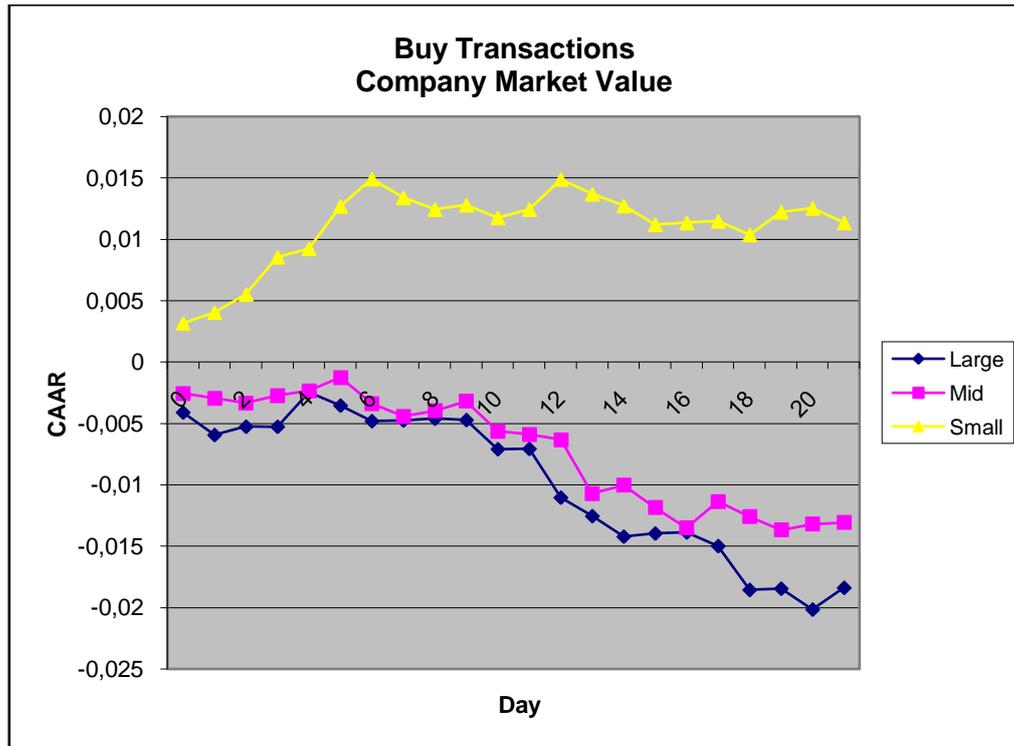
Diagram 5.3a. Buy transactions divided by company size.

It is interesting to see the results of insider sales from the three different categories. The smaller the company is, the larger the abnormal earnings over the long event window. These results follow those of the previous studies that make this categorization[103]. One explaining factor is the signalling effect of the trades. Trades in *small* can be seen as larger signals to the market since insiders in smaller companies have more information, according to previous studies[104]. Another explaining factor is that the liquidity of smaller companies is sensitive for any kind of news. When information about an insider transaction is made public the effect can therefore be greater in companies that are not as liquid in the market. Since the previous Swedish study lacks the categorization of buy and sell transactions we provide new evidence of the Swedish market. Wahlström make the categorisation by trading lists, not by market value. However we have synchronized our categorisations with the market value in the different list of Stockholm Stock Exchange, thereby making almost the same categorisation as Wahlström.

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[103] Jeng et al (2003), Lakonishok & Lee (2001)
[104] Ibid.
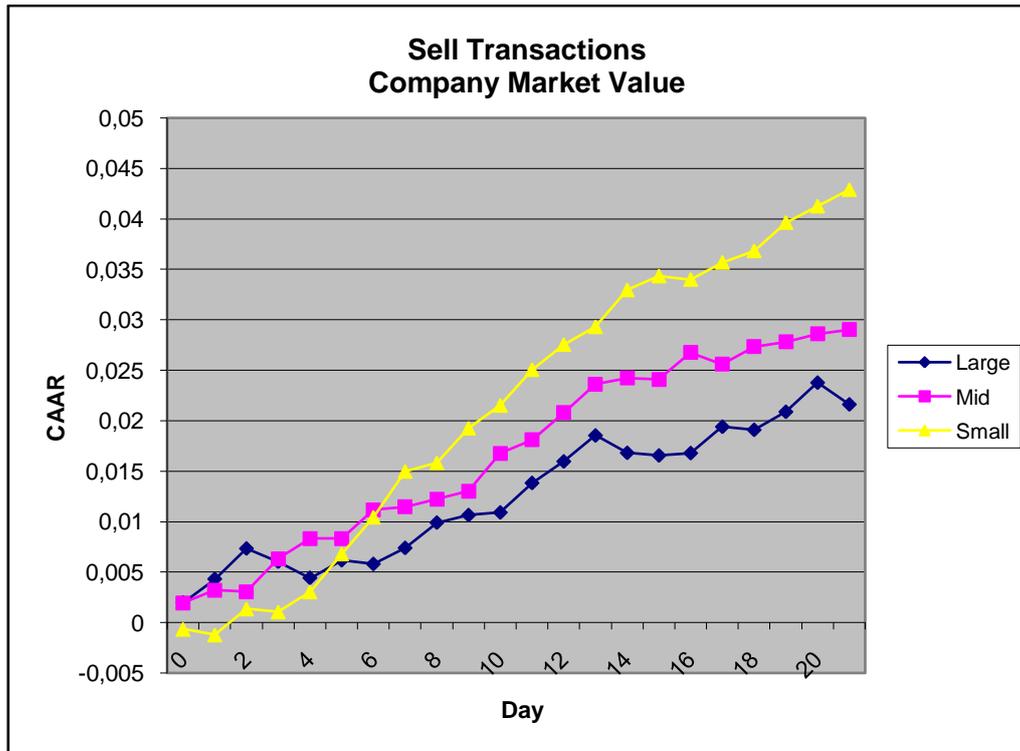
Diagram 5.3b. Sell transactions divided by company size.

In diagram 5.3b we illustrate the CAAR for the category company market value. What is noticeable is the curve of *small* during the short event window and the strong signalling effect of the event window. We can observe a smooth correction of the share prices instead of immediate correction.

If outsiders follow insiders for sales transactions in the different categories they yield 3,6 % for *small* s, 2,1 % for *mid* and 1,5 % for *large*. The best strategy for mimicking insiders is to follow insiders in smaller companies, which concurs with the results of Rozeff & Zaman in 1988. The mimicking strategy are lucrative for sales and not profitable for purchases.

5.4   Size of the Trade

The transactions in the portfolios in table 5.4 are all rejecting the null hypothesis, except for short sell transaction size C. The other portfolios have a strong significance level for either the p-value of the T-test or the Wilcoxon. All of the buy portfolios are normally distributed and only four of the sale portfolios are not normally distributed. The pattern for sell transactions is that the short event window data is normally distributed and that the data of the long event window is not.

Findings:

Transaction Type	Event Window	Transaction Size	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	SHORT	A	**-0,178%**	>0,05	-5,320	**0,000**	0,004
BUY	LONG	A	**-1,290%**	>0,05	-9,340	**0,000**	0,000
BUY	SHORT	B	**0,807%**	>0,05	-3,190	**0,010**	0,018
BUY	LONG	B	**0,347%**	>0,05	-2,470	**0,020**	0,028
BUY	SHORT	C	**0,780%**	>0,05	5,310	**0,000**	0,004
BUY	LONG	C	**-0,257%**	>0,05	6,560	**0,000**	0,000
BUY	SHORT	D	**-0,096%**	>0,05	-6,810	**0,000**	0,005
BUY	LONG	D	**-1,875%**	>0,05	-9,960	**0,000**	0,000
SELL	SHORT	A	**0,495%**	>0,05	-5,360	**0,000**	0,007
SELL	LONG	A	**3,385%**	<0,05	4,020	0,000	**0,006**
SELL	SHORT	B	**0,694%**	>0,05	-3,130	**0,011**	0,023
SELL	LONG	B	**2,878%**	<0,05	4,130	0,000	**0,003**
SELL	SHORT	C	0,927%	>0,05	-1,840	0,096	0,197
SELL	LONG	C	**3,765%**	<0,05	4,600	0,000	**0,001**
SELL	SHORT	D	**0,975%**	>0,05	3,060	**0,012**	0,009
SELL	LONG	D	**4,111%**	<0,05	6,450	0,000	**0,000**

Table 5.4 Findings for type and size of the trade.

We notice some fascinating results for the purchasing transactions. First of all we can see that the largest purchases are resulting in the lowest abnormal returns, over the long window. We believe that the explanation to this result is that many of the largest transactions are often made through a commissioner that has to match the sale with someone willing to purchase. The signal of the purchase in this case has had a negative impact to the performance of the share price. This depend on the fact that investors may want stability in their companies, and when a large portion of a company switches owners investors sell of their shares to invest in more stabile companies. This can also be the explanation of the abnormal performance of *D* transactions for sales. The positive abnormal earnings for transactions *B* are explained by Seyhun´s study from 1998, claiming that mid size transactions have higher abnormal returns than the largest and smallest. Some of the observed transactions *D* are probably also purchased and sold of another purpose, to increase or decrease power in the company, not to generate short term abnormal earnings.[105]

When studying sell portfolios we can convey approximately the same CAAR for the long event windows for transactions *A* and *C*. *B* transactions, which is rather small, have the lowest CAAR of 2,9 % for the long event window and transactions *D*, the largest transactions, have a CAAR of 4,1 %. This result pattern

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[105] Eckbo & Smith (1998)

is the same as observed in previous studies.[106] For the largest transactions we find the largest signalling effect, and the poor share performance is explained by the unwillingness of investors to own shares in companies with unstable ownership. Investors probably make the conclusion that the reason for selling such a large number of shares has to do with the future performance of the company. However an interesting remark is the CAAR of 0,975 % over the short window. We believe that when large transactions occur it will be publicly released earlier and the signalling effect occurs earlier. In diagram 5.4b it is rather clear that the publication is made day $\tau+3$, since the abnormal performance has a significant deviation.
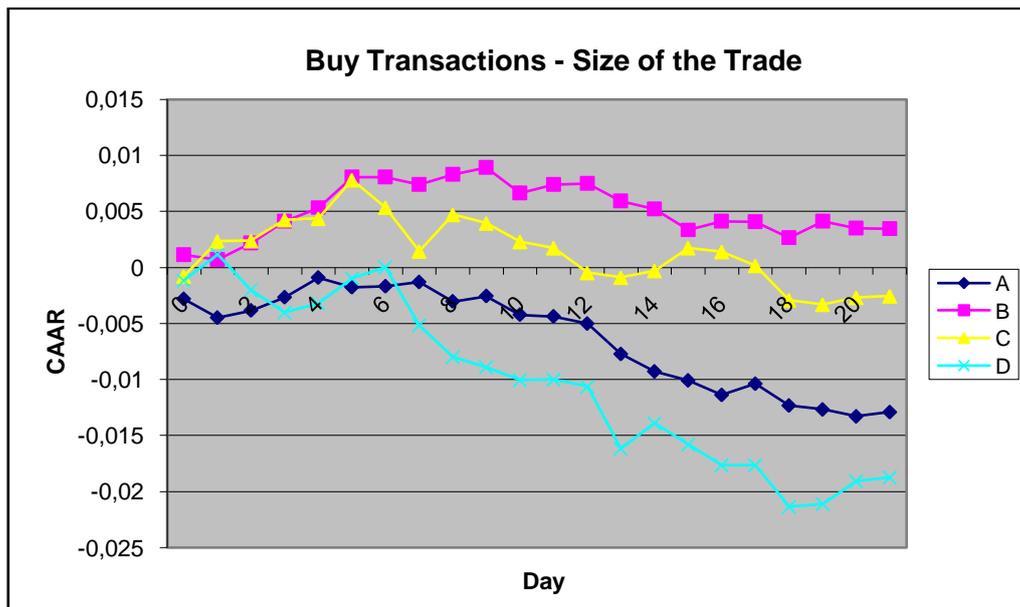

Diagram 5.4a. Buy transactions divided by transaction size.
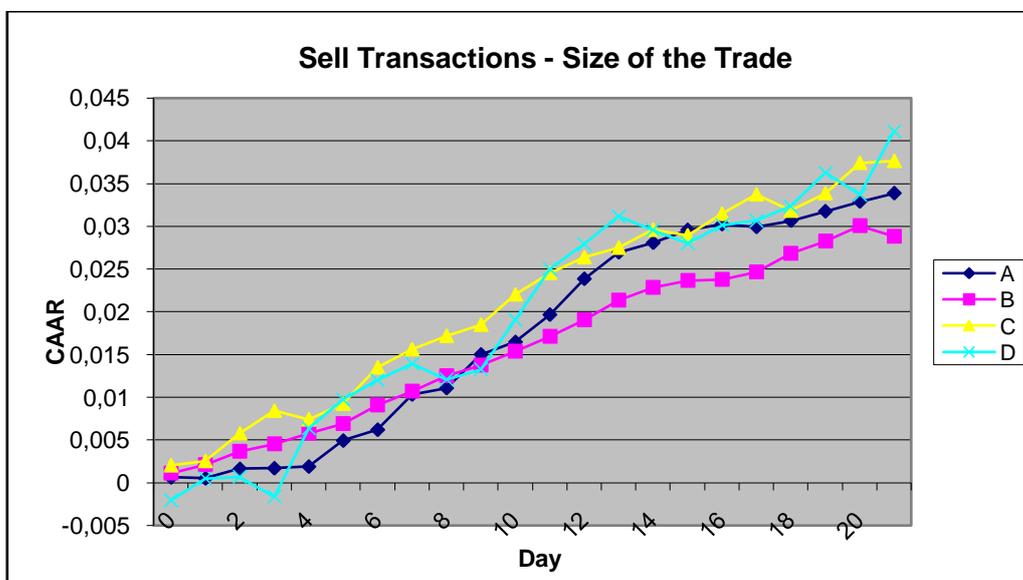
Diagram 5.4b. Sell transactions divided by transaction size.

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[106] Seyhun (1998)

An article from the American market state that the smallest and largest transactions generate smaller abnormal returns than mid size transactions.[107] For the purchasing transactions in our study we see the exact same pattern for both short and long event windows, which is illustrated in diagram 5.4a. However this pattern is not entirely correct for the short and long window for sales.

Mimicking behaviour from outside investors will also here be a lucrative investment for sales. For transactions *A* outsiders would approximately earn 2,9 %, transactions *B* 2,2 %, transactions *C* 2,8 % and transactions *D* 3,1 %.

5.5   Who is conducting the Trade

Findings:

Transaction Type	Event Window	Insider Type	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	SHORT	CEO	**0,200%**	>0,05	-3,75	**0,004**	0,014
BUY	LONG	CEO	**-1,333%**	>0,05	-7,17	**0,000**	0,000
BUY	SHORT	OTHER	**0,304%**	>0,05	-4,32	**0,001**	0,005
BUY	LONG	OTHER	**-0,518%**	>0,05	-8,38	**0,000**	0,000
BUY	SHORT	M. SHAREH.	**0,695%**	>0,05	-3,750	**0,004**	0,014
BUY	LONG	M. SHAREH.	0,198%	<0,05	-1,750	0,092	0,090
SELL	SHORT	CEO	**1,882%**	>0,05	4,540	**0,001**	0,005
SELL	LONG	CEO	**3,450%**	<0,05	9,080	0,000	**0,000**
SELL	SHORT	OTHER	**0,747%**	>0,05	-3,600	**0,005**	0,011
SELL	LONG	OTHER	**3,303%**	<0,05	4,260	0,000	**0,003**
SELL	SHORT	M. SHAREH.	**0,083%**	>0,05	-2,450	**0,034**	0,037
SELL	LONG	M. SHAREH.	3,056%	<0,05	2,400	0,024	0,082

Table 5.5 Findings for type and who is conducting the trade.

The statistical analysis of the portfolios of these categories shown in table 5.5 illustrates that almost all of the purchasing portfolios are normally distributed. The only portfolio not rejecting the null hypothesis is the long buy for major shareholder. For the sale portfolios it is also the long major shareholder portfolio that does not reject the null hypothesis. The p-values are low for all portfolios except short sell major shareholder with 0,034 but still significant with the α-value of 0,05.

This categorization has are used in previous studies, stating that normally the CEO has access to more information and the signalling effect of the CEO´s trades should be the strongest.[108] The opinion about the major shareholder departs in previous studies. In smaller companies the major shareholder might be more

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[107] Seyhun (1998)
[108] Seyhun (1998), Jeng et al (2003)

active and are in possession of more information about the company than major shareholders in large companies.
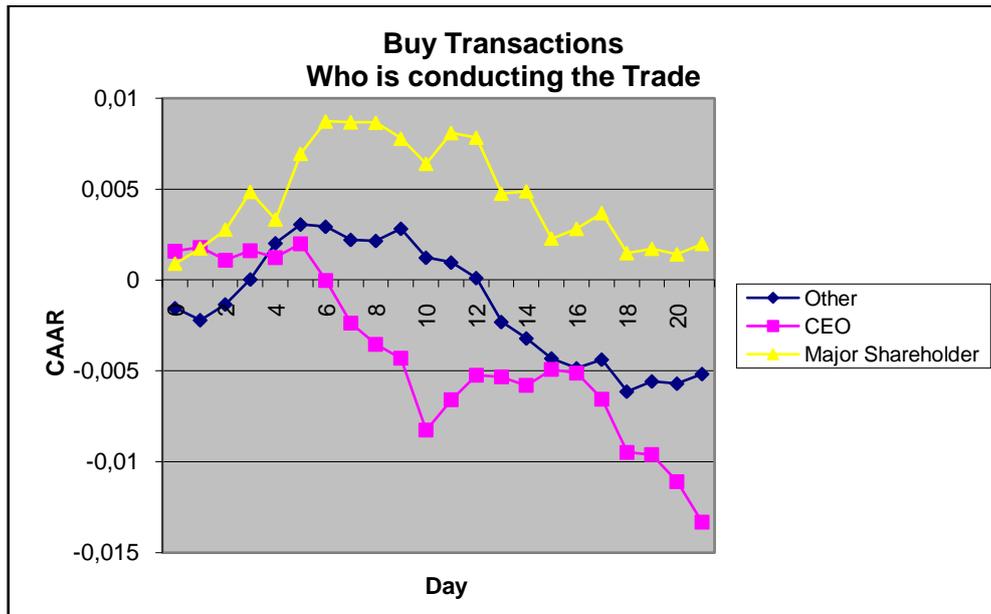
Diagram 5.5a. Buy transactions divided by who is conducting the trade.

The findings of purchasing performance of the different categories contradict the theory that the *CEO* stands to generate larger abnormal earnings based on information asymmetry. One reason we can find to the poor performance of the *CEO´s* purchases is the extensive scrutiny of his/her trades, making the *CEO* extra careful in the timing of trading, which are pointed out in previous studies[109]. Another theory is that a *CEO* purchase shares when he/she starts working in a new company, and this type of transaction has no strong signalling effect to the market. *Major shareholders* are those that generate the highest CAAR and our suggestion is that *major shareholders* can make some demands before investing in smaller companies. So when they actually invest, the market reacts positive to this and normally when a *major shareholder* purchases shares, the publication occurs before the short event window ends. We assume that the publication takes place day 4, which can be observed in diagram 5.5a. So the positive result for *major shareholder* in the short event window might be a result from the earlier publication. The category *others*, do not face that much scrutiny and can act somewhat in the dark. According to the law prohibiting short term trading[110], some of the insiders under the category *other* can trade within the 30 days prior to a publication of an interim report. We believe that this might be why the category is outperforming the *CEO*, even though the *CEO* has more knowledge of operations.

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[109] Jeng et al (2003)
[110] SFS (2005:377)

For sell portfolios we detect similar pattern as for purchases. When the *CEO* sell shares the share prices drop and the *CEO´s* abnormal performance goes up as he/she avoids losses. There can be a number of reasons for the *CEO* to sell shares. For example when he/she leave the position it is normal to sell all the shares owned. The other more frightening situation for investors is if the *CEO* uses exclusive non public information to avoid future losses. Also for sales it might be the earlier publication of the trade that generates a high CAAR for the short event window for the *CEO*, observed in diagram 5.5b, where it seems like the publication takes place day τ+1. The CAAR of the category *others* are rather high, but as earlier stated they can act below the radar, since they do not get as investigated as the *CEO*.[111] Unfortunately the long event window result of the major shareholder does not reject the null hypothesis, therefore we are unable to draw any conclusions of the CAAR received.
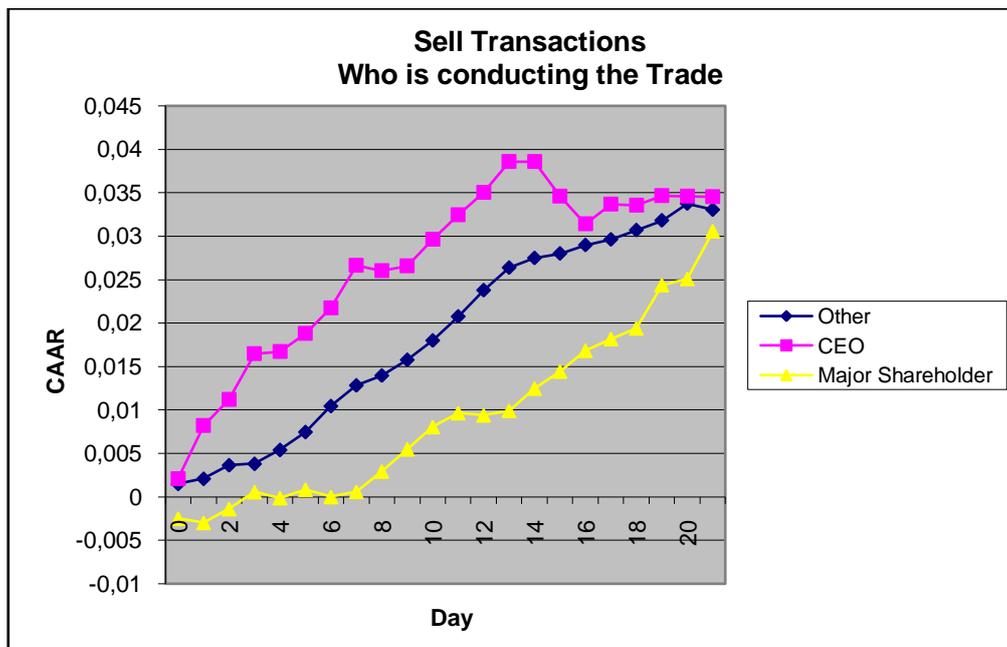
Diagram 5.5b. Sell transactions divided by who is conducting the trade.

5.6   Other Findings

The efficient market hypothesis (EMH) claims that if the market is strong efficient, there will not exist abnormal earnings since both public and private information are already reflected in the share price[112]. Our study will test if the strong form efficiency applies for legal insider trading. If we suppose that the hypothesis is not rejected, the occurrence of insider transactions would dramatically decrease since insiders would not generate abnormal returns. Our finding of abnormal returns in the Swedish market forces us to reject the strong

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[111] Jeng et al (2003)
[112] Fama (1970)

form efficiency of EMH. To accept the strong form efficiency the adaption curves would show a more dramatic correction direct upon insider transactions. Since the curves are adapting over time the strong form is rejected. The conclusion drawn is that the Swedish market is not strong form efficient.

5.6.1 Matrix portfolios; Short Event Window

The matrix portfolios we create can give some further explanation to which trades, conducted by whom in what size of a company, that generate abnormal returns. We present the results of these matrix portfolios for Large and Small companies to see the far end of the tails. The results for Mid companies are presented in the Appendix.

Transaction Type	Insider Type	Transaction Size	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	CEO	A	-1,174%	>0,05	1,810	0,100	0,120
BUY	CEO	B	0,459%	>0,05	8,480	0,000	0,004
BUY	CEO	C	0,520%	>0,05	6,890	0,000	0,004
BUY	CEO	D	-3,416%	>0,05	-1,270	0,232	0,351
SELL	CEO	A					
SELL	CEO	B	-1,001%	>0,05	-6,740	0,000	0,004
SELL	CEO	C	-0,546%	>0,05	11,640	0,000	0,004
SELL	CEO	D	3,638%	>0,05	6,450	0,000	0,004
BUY	OTHER	A	-0,548%	>0,05	-2,480	0,032	0,056
BUY	OTHER	B	0,541%	>0,05	3,610	0,005	0,009
BUY	OTHER	C	-2,469%	>0,05	-2,460	0,034	0,056
BUY	OTHER	D	-2,163%	>0,05	-5,510	0,000	0,005
SELL	OTHER	A	1,092%	>0,05	4,070	0,002	0,007
SELL	OTHER	B	0,405%	>0,05	-2,480	0,032	0,045
SELL	OTHER	C	0,415%	>0,05	-3,180	0,010	0,014
SELL	OTHER	D	2,070%	>0,05	-6,190	0,000	0,004
BUY	M. SHAREHOLDER	A	-3,831%	>0,05	-8,150	0,000	0,004
BUY	M. SHAREHOLDER	B	-0,666%	>0,05	4,270	0,002	0,009
BUY	M. SHAREHOLDER	C	-1,665%	>0,05	-7,840	0,000	0,004
BUY	M. SHAREHOLDER	D	-2,230%	>0,05	-4,110	0,002	0,009
SELL	M. SHAREHOLDER	A	1,917%	>0,05	6,600	0,000	0,004
SELL	M. SHAREHOLDER	B	0,387%	>0,05	1,580	0,145	0,266
SELL	M. SHAREHOLDER	C	0,824%	>0,05	2,730	0,021	0,045
SELL	M. SHAREHOLDER	D	0,769%	>0,05	4,960	0,001	0,007

Table 5.6.1a. Short event window for large companies.

In table 5.6.1a we account for the results of the matrix portfolios for the short event window for large companies. There are some interesting observations worth mentioning. Purchasing transactions for the CEO in large companies show that the

CEO generates abnormal returns for mid size transactions for purchases and the largest, D for sales. When dividing the trades into these sub portfolios we find results of significant abnormal performance for the short event window. From these results we draw the conclusion that the signalling effect of the CEO and major shareholders occur before the end of the short event window, causing a correctional effect on the share price. On the other hand the results might be a result of leakage before the publication of the trade. A pattern noticeable from both table 5.6.1a and 5.6.1b is that the data is normally distributed, except for CEO sales in small companies.

Transaction Type	Insider Type	Transaction Size	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	CEO	A	**0,915%**	>0,05	-6,09	**0,000**	0,005
BUY	CEO	B	**1,517%**	>0,05	2,90	**0,016**	0,023
BUY	CEO	C	**2,683%**	>0,05	8,30	**0,000**	0,004
BUY	CEO	D	**-2,305%**	>0,05	-4,38	**0,000**	0,009
SELL	CEO	A	**0,853%**	>0,05	3,97	**0,003**	0,007
SELL	CEO	B	1,082%	>0,05	-1,63	0,135	0,168
SELL	CEO	C	**1,961%**	>0,05	5,22	**0,000**	0,004
SELL	CEO	D	0,398%	<0,05	-2,04	0,068	0,045
BUY	OTHER	A	0,923%	>0,05	-0,83	0,425	0,398
BUY	OTHER	B	1,851%	>0,05	0,90	0,389	0,689
BUY	OTHER	C	**2,191%**	>0,05	5,90	**0,000**	0,004
BUY	OTHER	D	**0,664%**	>0,05	-11,45	**0,000**	0,004
SELL	OTHER	A	**0,300%**	>0,05	-7,51	**0,000**	0,007
SELL	OTHER	B	**0,915%**	>0,05	-3,26	**0,009**	0,018
SELL	OTHER	C	**0,530%**	>0,05	-4,91	**0,001**	0,007
SELL	OTHER	D	**1,441%**	>0,05	-2,54	**0,029**	0,037
BUY	M. SHAREHOLDER	A	**-3,831%**	>0,05	-8,15	**0,000**	0,004
BUY	M. SHAREHOLDER	B	0,830%	>0,05	0,02	0,988	0,965
BUY	M. SHAREHOLDER	C	**2,972%**	>0,05	4,34	**0,001**	0,005
BUY	M. SHAREHOLDER	D	**1,378%**	>0,05	3,93	**0,003**	0,011
SELL	M. SHAREHOLDER	A	**2,946%**	>0,05	3,53	**0,005**	0,009
SELL	M. SHAREHOLDER	B	**-0,703%**	>0,05	-5,21	**0,000**	0,007
SELL	M. SHAREHOLDER	C	**0,536%**	>0,05	-5,64	**0,000**	0,005
SELL	M. SHAREHOLDER	D	-0,477%	>0,05	-0,76	0,466	0,450

Table 5.6.1b. Short event window for small companies.

The findings of the short event window for small companies once again show that the CEO generates abnormal returns for purchases. The returns are gained from midsize transactions and small transactions. It seems like the market correction of share prices for the major shareholder does not occur within the short event window for sales. The publication of larger purchases for *major shareholders* are made somewhere in between day 1 to 5, explaining the positive abnormal return

for larger transactions. The results of *others* within the short event window are interesting, since the short term trading law is not applicable to some of these insiders. What is seen is a significant abnormal return for this category, confirming that the law might have a flaw in not including these individuals in the short term trading ban.

5.6.2 Matrix portfolios; Long Event Window

Transaction Type	Insider Type	Transaction Size	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	CEO	A	**0,400%**	>0,05	6,320	**0,000**	0,000
BUY	CEO	B	**0,416%**	>0,05	15,880	**0,000**	0,000
BUY	CEO	C	**-1,102%**	>0,05	7,260	**0,000**	0,000
BUY	CEO	D	**-8,286%**	>0,05	-6,290	**0,000**	0,000
SELL	CEO	A					
SELL	CEO	B	**1,732%**	>0,05	-1,450	**0,160**	0,153
SELL	CEO	C	**3,419%**	>0,05	16,290	**0,000**	0,000
SELL	CEO	D	**2,922%**	>0,05	10,730	**0,000**	0,000
BUY	OTHER	A	**-2,540%**	<0,05	-5,510	0,000	**0,000**
BUY	OTHER	B	**-0,155%**	>0,05	2,640	**0,014**	0,023
BUY	OTHER	C	**-4,973%**	>0,05	-7,720	**0,000**	0,000
BUY	OTHER	D	**-7,755%**	<0,05	-9,940	0,000	**0,000**
SELL	OTHER	A	**2,974%**	<0,05	7,200	0,000	**0,000**
SELL	OTHER	B	**2,111%**	>0,05	2,340	**0,027**	0,056
SELL	OTHER	C	1,172%	>0,05	-0,820	0,420	0,622
SELL	OTHER	D	**0,019%**	>0,05	-3,010	**0,006**	0,014
BUY	M. SHAREHOLDER	A	**-4,626%**	<0,05	-15,090	0,000	**0,000**
BUY	M. SHAREHOLDER	B	**-2,065%**	>0,05	-2,860	**0,008**	0,011
BUY	M. SHAREHOLDER	C	**-2,526%**	>0,05	-11,500	**0,000**	0,000
BUY	M. SHAREHOLDER	D	**-5,136%**	>0,05	-9,510	**0,000**	0,000
SELL	M. SHAREHOLDER	A	**4,028%**	>0,05	7,880	**0,000**	0,000
SELL	M. SHAREHOLDER	B	1,730%	>0,05	-0,550	0,588	0,657
SELL	M. SHAREHOLDER	C	**6,167%**	>0,05	5,980	**0,000**	0,000
SELL	M. SHAREHOLDER	D	**4,891%**	>0,05	12,070	**0,000**	0,000

Table 5.6.2a. Long event window for large companies.

The observations in table 5.6.2a of the long event window for large companies confirm some of our earlier conclusions. *CEO*s are the only type of insiders that make abnormal earnings on purchasing transactions, although it is through the smallest transactions. A bold statement is that when a CEO wishes to act upon exclusive information, he knows that a large transaction will be scrutinized by FI.

So in order to generate abnormal returns, he/she divides the large transaction into a number of smaller transactions[113].

The major shareholders generate negative abnormal earnings for purchasing transactions. The negative share price performance of major shareholders transactions confirm our previous theory that instable ownership scares of other investors. The fact that transactions of type A has such an impact on abnormal performance is a bit confusing, but we believe that many of the small transactions for major shareholders are clustered, hence the same signalling effect as a larger transaction. Another remarkable result is the negative abnormal earning of more than 8 % for transaction D for CEOs. Our previously stated theory is that CEOs in general purchase shares when they start working for the company, which can explain the result. In general this kind of transaction has no signalling effect to the market, since it is expected that the CEO will purchase shares.

Transaction Type	Insider Type	Transaction Size	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	CEO	A	**0,137%**	>0,05	-11,94	**0,000**	0,000
BUY	CEO	B	-0,797%	>0,05	2,01	0,550	0,056
BUY	CEO	C	**-0,650%**	>0,05	4,96	**0,000**	0,000
BUY	CEO	D	**-2,104%**	<0,05	-10,94	0,000	**0,000**
SELL	CEO	A	**-7,698%**	>0,05	5,010	**0,000**	0,000
SELL	CEO	B	**-0,439%**	>0,05	2,220	**0,035**	0,056
SELL	CEO	C	**4,297%**	>0,05	10,030	**0,000**	0,000
SELL	CEO	D	**2,224%**	<0,05	-4,890	0,000	**0,000**
BUY	OTHER	A	1,038%	>0,05	1,950	0,062	0,082
BUY	OTHER	B	**1,826%**	<0,05	6,410	0,000	**0,000**
BUY	OTHER	C	**1,516%**	<0,05	14,590	0,000	**0,000**
BUY	OTHER	D	**1,841%**	>0,05	-14,910	**0,000**	0,000
SELL	OTHER	A	**5,389%**	<0,05	3,590	0,001	**0,004**
SELL	OTHER	B	**4,090%**	<0,05	4,120	0,000	**0,003**
SELL	OTHER	C	5,444%	>0,05	1,450	0,160	0,264
SELL	OTHER	D	**7,149%**	>0,05	3,790	**0,001**	0,003
BUY	M. SHAREHOLDER	A	**-4,626%**	<0,05	-15,090	0,000	**0,000**
BUY	M. SHAREHOLDER	B	**1,643%**	>0,05	5,270	**0,000**	0,000
BUY	M. SHAREHOLDER	C	**7,127%**	>0,05	8,980	**0,000**	0,000
BUY	M. SHAREHOLDER	D	**1,032%**	>0,05	7,680	**0,000**	0,000
SELL	M. SHAREHOLDER	A	**7,741%**	>0,05	7,730	**0,000**	0,000
SELL	M. SHAREHOLDER	B	**1,798%**	>0,05	-8,100	**0,000**	0,000
SELL	M. SHAREHOLDER	C	4,542%	>0,05	-1,750	0,092	0,090
SELL	M. SHAREHOLDER	D	3,561%	>0,05	1,250	0,221	0,368

Table 5.6.2b. Long event window for small companies.

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[113] Jeng et al (2003)

The results exhibited in table 5.6.2b are some of the most interesting of in our study. It proves that insiders in smaller companies often generate abnormal earnings. The pattern for the CEO transactions shows that positive abnormal earnings are only generated for transactions C and D for sales and A for purchases. When the CEO conducts larger transactions than C, the fear of obviously acting on exclusive information could explain the lower abnormal earnings. The results of the category *others* generate consistent high positive abnormal earnings for both purchases and sales. We think that it is obvious that legislators in Sweden must include all types of insiders in the ban against short term trading, in order to prevent these positive results for others. The fact that the major shareholders purchasing transactions C have higher abnormal returns than D is a confirmation of the problem with matching sellers with purchasers through commissionaires. Unfortunately the statistical significance of transactions C and D for sales accept the null hypothesis and no abnormal performance can be observed.

6 Conclusion

In this final chapter we present the final conclusion of this study. We answer the purpose of our study and describe our contribution to the theory. We will finish the thesis with some advice of future studies.

6.1 Conclusion of Our Study

The first conclusion that we make is that the strong form of the efficient market hypothesis is rejected for the Swedish Stock Market. The presence of positive abnormal earnings for aggregated sell portfolios and short aggregated buy portfolio, and negative abnormal return for long aggregated buy portfolio implicate that insiders generate abnormal earnings by trading shares in their own company in Sweden, which is the answer to our main purpose. For the long event window find a CAAR of 3,25 % for sales and -0,5 % for purchases.

The purpose of our study is also to pinpoint the potential factors generating abnormal returns for insiders. By dividing all insider transactions made between 2005-01-01 to 2007-10-01 by company market value, size of the transaction and type of insider we have found results confirming that abnormal returns varieties depending on these factors.

We have found empirical evidence that clearly shows that the company´s market value at the time of the transactions is correlated to the percentage of abnormal returns yielded by insiders. The evidence states that the category of small companies generates the highest CAAR, mid companies generates a CAAR in between and large companies generate the smallest CAAR. We claim that the reason for this pattern is twofold; smaller companies are normally not as liquid in the share market which means that an insider trade causes a larger impact on share-prices. The other reason is that insiders in smaller companies have access to more exclusive information, since they have a broader overview of the company´s entire operation, than an insider in a large company. We find that insiders generate positive abnormal earnings for sales, no matter company size but only the insiders in small companies generate positive abnormal earnings for purchases.

The size of the transaction has some explaining evidence of where abnormal earnings are created. The four categories within transaction size have different patterns depending on if it is a purchase or a sale. The pattern of purchases is that the smallest and largest transactions have lowest CAAR and mid size transactions have higher CAAR. The pattern for sales is that increases in transaction size are

correlated to increases in abnormal earnings. The signalling theory states that larger transactions generate stronger signals to the market, which should create larger abnormal earnings. This is the case for sales. For purchases we draw the same conclusions for the largest transactions, which is that large transactions generate fear of instable ownership and future decreases of cash flow, to the market. This has the implication of lower share prices, leading to larger abnormal returns for sales, as the insider avoids the price drop of the share. This also generate less abnormal returns for purchases.

Our evidence of the three insider types used in our study, confirms that abnormal earnings depend on who is conducting the insider transaction. For the buy-portfolio we found that the CEO and the category other have negative CAAR, the CEO has the lowest. Major shareholders have a small positive CAAR. The reasons for these results can be described with a number of explanations. The CEO´s earnings from insider trading will always be scrutinized by analysts and newspapers and therefore the CEO avoids trading in a way that will generate short term abnormal earnings, which might generate negative publicity. The major shareholder generates positive abnormal earnings due to negotiation advantages when purchasing large amount of shares, and time the purchases with periods of positive abnormal share performance. For sales the CEO generates the largest CAAR, which is explained by the signalling effect of a sale from the position with most knowledge of the company´s operations. Evidence shows that instability in the ownership of a company frightens investors, leading to poor share price performance when a major shareholder sells shares. The category other is interesting since it contains insiders not banned from making short term trades before the publication of an interim report. We believe this is the reason for the category to perform better than the CEO for purchases. We believe that the CAAR for others would change if the legislators included all insiders in the short term trading ban.

The final contribution of this thesis is the results from the matrix portfolios of large and small companies. We have constructed a matrix of all the categories used to see patterns in abnormal earnings behaviour. The matrixes confirm some of our previous findings, such as insiders in small companies generate larger abnormal returns than insiders in large companies. We prove that the category *others* outperform the CEO for purchases and sales in smaller companies, where they do not get examined to the full extent as in large companies. We identify a pattern that large transactions generally generate higher abnormal returns, due to stronger signalling effect than small transactions. The matrix constructed is unique in a sense that no other study, to our knowledge, has constructed such descriptive portfolios for explaining what factors that generate abnormal earnings.

6.2   Future Studies

Future studies that could build directly upon this thesis are if the matrix portfolios applied in other countries would yield same results. In Sweden it would be interesting to do a study over a longer event window, to observe if the theory of longer investment horizons for the CEO applies.

A fourth factor that could be added to pinpoint abnormal earnings is clustering transactions. The classification could be clustering trades and single trades. Intuition tells us that insiders conducting cluster transactions over a short period of time has a stronger signalling power than a single transaction. It could be interesting to see the difference in abnormal earnings for the clustering trades and single trades.

It would be interesting to see if the results of our study would be the same over a longer period of time. If we had taken all the transactions from 1990 to 2007, would we have found the same results?

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Appendix

Matrix Portfolios; Mid Size

Transaction Type	Insider Type	Transaction Size	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	CEO	A	-0,723%	0,062	-10,500	0,000	0,004
BUY	CEO	B	1,059%	0,602	-6,950	0,000	0,004
BUY	CEO	C	-2,147%	0,703	4,240	0,002	0,009
BUY	CEO	D	2,965%	0,419	3,220	0,009	0,009
SELL	CEO	A	-0,808%	0,536	3,350	0,007	0,018
SELL	CEO	B	3,565%	0,054	1,950	0,080	0,168
SELL	CEO	C	3,474%	0,214	-3,570	0,005	0,007
SELL	CEO	D	2,681%	0,863	7,460	0,000	0,004
BUY	OTHER	A	-0,877%	0,028	-4,760	0,001	0,005
BUY	OTHER	B	-0,422%	0,012	-5,540	0,000	0,004
BUY	OTHER	C	-0,454%	0,325	-7,950	0,000	0,004
BUY	OTHER	D	3,022%	0,092	2,490	0,032	0,083
SELL	OTHER	A	-0,145%	0,067	-8,380	0,000	0,004
SELL	OTHER	B	0,962%	0,497	0,840	0,418	0,563
SELL	OTHER	C	2,075%	0,050	1,080	0,306	0,563
SELL	OTHER	D	0,308%	0,464	6,550	0,000	0,004
BUY	M. SHAREHOLDER	A	1,955%	0,509	-5,110	0,000	0,005
BUY	M. SHAREHOLDER	B	1,147%	0,206	-6,470	0,000	0,004
BUY	M. SHAREHOLDER	C	2,465%	0,442	-2,710	0,022	0,037
BUY	M. SHAREHOLDER	D	1,238%	0,306	3,300	0,008	0,007
SELL	M. SHAREHOLDER	A	-5,784%	0,877	1,120	0,291	0,230
SELL	M. SHAREHOLDER	B	-1,538%	0,549	0,770	0,460	0,351
SELL	M. SHAREHOLDER	C	-1,597%	0,543	6,050	0,000	0,004
SELL	M. SHAREHOLDER	D	0,891%	0,053	1,710	0,119	0,168

Table Appendix a. Short event window for mid companies.

Transaction Type	Insider Type	Transaction Size	CAAR	Normality	T-test	P-value	Wilcoxon
BUY	CEO	A	-0,188%	0,146	-12,350	0,000	0,000
BUY	CEO	B	-1,907%	0,881	-11,170	0,000	0,000
BUY	CEO	C	-3,915%	0,158	-0,680	0,500	0,478
BUY	CEO	D	2,093%	0,267	6,660	0,000	0,000
SELL	CEO	A	-2,748%	0,834	2,150	0,038	0,063
SELL	CEO	B	4,088%	0,004	7,650	0,000	0,000
SELL	CEO	C	8,236%	0,190	2,120	0,044	0,059
SELL	CEO	D	6,910%	0,896	12,830	0,000	0,000
BUY	OTHER	A	-2,588%	0,072	-10,330	0,000	0,000
BUY	OTHER	B	-0,507%	0,005	-14,600	0,000	0,000
BUY	OTHER	C	-2,338%	0,519	-12,370	0,000	0,000
BUY	OTHER	D	1,291%	0,451	7,000	0,000	0,000
SELL	OTHER	A	1,166%	0,003	-2,240	0,034	0,018
SELL	OTHER	B	3,247%	0,318	5,590	0,000	0,000
SELL	OTHER	C	4,259%	0,969	6,460	0,000	0,000
SELL	OTHER	D	4,309%	0,070	9,160	0,000	0,000
BUY	M. SHAREHOLDER	A	-3,013%	0,139	-6,620	0,000	0,000
BUY	M. SHAREHOLDER	B	1,488%	0,006	-4,610	0,000	0,000
BUY	M. SHAREHOLDER	C	-0,933%	0,196	-2,480	0,020	0,030
BUY	M. SHAREHOLDER	D	0,436%	0,018	7,230	0,000	0,000
SELL	M. SHAREHOLDER	A	-8,017%	0,005	-5,170	0,000	0,001
SELL	M. SHAREHOLDER	B	0,798%	0,509	1,020	0,318	0,190
SELL	M. SHAREHOLDER	C	-1,033%	0,969	7,050	0,000	0,000
SELL	M. SHAREHOLDER	D	2,959%	0,010	5,840	0,000	0,000

Table Appendix b. Long event window for mid companies.

Companies Included

Large Cap	CLAS OHLSON	OPCON
ALFA LAVAL	CLOETTA FAZER	CASH GUARD
ASSA ABLOY	CONCORDIA MARITIME	CONSILIUM
ATLAS COPCO	DAGON	CTT SYSTEMS
ABB	ELANDERS	CYBERCOM GROUP
AUTOLIV	FAGERHULT	DIAMYD MEDICAL
AXFOOD	FAST PARTNER	DIGITAL VISION
AXIS	FASTIGHETS BALDER	DIN BOSTAD
BOLIDEN	G & L BEIJER	DORO
CARNEGIE	GUNNEBO	ORTIVUS
CASTELLUM	HALDEX	DUROC
ELECTROLUX	HEBA FASTIGHETS	ELEKTRONIKGRUPPEN
ELEKTA	HIQ INTERNATIONAL	ENEA
ENIRO	HOME PROPERTIES	EXPANDA
ERICSSON	HQ	FEELGOOD
GETINGE	HÖGANÄS	FENIX OUTDOOR
H & M	IBS	FINGERPRINT CARDS
HANDELSBANKEN	INDUSTRIAL AND FINANCIAL SYSTEMS	GEVEKO
HEXAGON	INTRUM JUSTITIA	HAVSFRUN
HOLMEN	KLÖVERN	HL DISPLAY
INDUSTRIVÄRDEN	LBI INTERNATIONAL	HUMAN CARE
INVESTOR	LINDEX	INTELLECTA
JM	MEKONOMEN	JEEVES
KINNEVIK	MICRONIC	KABE HUSVAGNAR
KUNGSLEDEN	MIDWAY HOLDING	KARO BIO
L E LUNDBERGFÖRETAGEN	MUNTERS	KMT GROUP
LATOUR	NEONET	PHONERA
LUNDIN PETROLEUM	NET INSIGHT	KNOW IT
MEDA	NEW WAVE	POOLIA
MTG	NOLATO	LAGERCRANTZ
NCC	NORDNET	LEDSTIERNAN
NIBE	ORC SOFTWARE	MANDATOR
NOBIA	PARTNERTECH	MEDIVIR
NORDEA	PROFFICE	MIDELFART SONESSON
OMX	Q-MED	MOBYSON
PEAB	RAYSEARCH LAB	MSC KONSULT
RATOS	RNB	MULTIQ INTERNATIONAL
SAAB	SECTRA	NETONNET
SANDVIK	SECURITAS	NILÖRNGRUPPEN
SAS	SKANDITEK INDUSTRIFÖRVALTNING	NOCOM
SCA	SKISTAR	NOVACAST
SCANIA	STUDSVIK	NOVESTRA
SEB	SWECO	PRECISE BIOMETRICS
SECO TOOLS	SVEDBERGS	PREVAS
SKANSKA	SÄKI	PRICER
SKF	TELECA	PROACT IT
SSAB	TELELOGIC	PROBI
SWEDBANK	VBG GROUP	PROFILGRUPPEN
SWEDISH MATCH	ÅNGPANNEFÖRENINGEN	READSOFT
TELE2	**Small Cap**	REDERI TRANSATLANTIC
TELIASONERA	ACANDO	ROTTNEROS
TRELLEBORG	ACAP INVEST	RÖRVIK TIMBER
WALLENSTAM	A-COM	SALUSANSVAR
VOLVO	ACADEMEDIA	SCRIBONA
VOSTOK GAS LTD	ADDNODE	SEMCON
ÖRESUND	AFFÄRSSTRATEGERNA	SENSYS TRAFFIC
Mid Cap	ARTIMPLANT	SIGMA
ACTIVE BIOTECH	ASPIRO	SINTERCAST
ADDTECH	AUDIODEV	SOFTRONIC
ANOTO GROUP	BEIJER ELECTRONICS	SWITCHCORE
ATRIUM LJUNGBERG	BERGS TIMBER	SVOLDER
AVANZA	BIOGAIA	TECHNOLOGY NEXUS
B & B TOOLS	BIOINVENT	TELIGENT
BALLINGSLÖV	BIOLIN	THALAMUS NETWORKS
BEIJER ALMA	BIOPHAUSIA	TICKET
BETSSON	BIOTAGE	TRACTION
BILIA	BONG LJUNGDAHL	TRICORONA
BILLERUD	BORÅS WÄFVERI	WEDINS SKOR & ACC
BRINOVA	BOSS MEDIA	WESTERGYLLEN
BROSTRÖM	NOVOTEK	VITROLIFE
BURE EQUITY	OEM INTERNATIONAL	XANO INDUSTRI
CARDO AB	BRIO	XPONCARD GROUP
CISION	BTS GROUP	ZODIAK TELEVISION

Table Appendix c. Companies included in our study.