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INSIDER TRADING AND ABNORMAL RETURN ON THE SWEDISH STOCK MARKET

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Abstract

Title: Insider trading and abnormal return on the Swedish stock market

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Purpose: By using classifications of different kinds of insiders we wish to enlighten this area of study with empirical evidence of how insiders on the Swedish Stock Exchange yield abnormal returns. Furthermore, and perhaps more importantly, we seek to introduce a classification of insider transaction not used on Swedish data before with cluster transactions. Ultimately, the purpose is to see in what sense outside investor are able to earn abnormal returns by imitating the different classifications of insiders.

Methodology: This study is conducted with a quantitative approach and has used an event study framework. A division of the original sample is made in form of firm size, industry classification and phase of business cycle. Statistical tests are performed to determine if the results are significant.

Theoretical perspectives: Theories covered in the study are for example information asymmetry, efficient market hypothesis and signalling hypothesis.

Empirical foundation: 125 657 buy- and sell transactions made by insiders on NASDAQ OMX Stockholm between the years of 2005-2014 are studied. The original sample has been scanned for cluster formation, where 2 659 were detected. The study investigates all transactions undertaken by insiders from Large-, Mid- and Small Cap-companies. Also, delisted companies are included.

Conclusion: Cluster formations prove to be a strong signal for outsiders in terms earning abnormal returns. Mid- and Small Cap-companies show larger abnormal returns than Large Cap-companies, thus leading to the conclusion of a prevailing information asymmetry across smaller firms. Transactions conducted during years of expansion are more informative than those performed during years of recession. Sales clusters have a larger explanatory power than purchase clusters.

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Chapter 1 Introduction

In the first chapter, an introduction of the subject will be given. The problem discussion and the purpose of the study will be discussed. The aim is to give the reader a clear insight into the topic of the study and a curiosity to continue exploring the subject

1.1 Background

"For 12 out of the last 18 years, the fund has outperformed the market with a yearly average being 13 percent better than the benchmark index"

The quote is taken from Didner & Gerge's year-end letter from 2014 and describes the company's return for its Swedish equity fund, investing in traded Swedish firms. What it further illustrates is the fascinating phenomenon of certain investors, constantly seeming to beat the average return of the market. The perhaps most famous example of this is presumably Warren Buffet and his conglomerate Berkshire Hathaway. The company has had a staggering return of 1 826 163%, or an annual return of 22%, since 1965 (shareholder letter Berkshire Hathaway 2014). How is this possible? The answer is that the Swedish market, like the American or any other market, suffers from imperfections. Many questions can be raised on how practically this practically is done. In order to constantly exceed the market, the information available to different investors within market cannot be in balance with the firms holding it. If one was to beat the market, it would not only mean extraordinary returns, it would also go against one of the most famous researchers within the field of efficient financial markets, Eugene Fama. Fama developed the efficient market hypothesis in 1970 stating that it is not possible to beat the market since all information is already incorporated in the current stock price. As expected with controversial theories, counterparts who also studied the financial market came to opposite conclusions, opening up for new angles to study. Situations referring to different levels of information knowledge can be derived to the terms of outsiders and insiders. Outsiders being the uninformed investors without insight to firms and striving to achieve that extra return on capital. Insiders on the other hand, are persons closely affiliated to the management of the company and thus enjoying the benefits of being involved with the decision-making. Do insiders have larger possibilities of achieving extra return on their investments? Intuitively, one would think so. Who but the insiders know when their company's stock price is undervalued compared to what the bright future will bring? Naturally, insiders are allowed to trade their company's stock. This

trading is called insider trading. In the following study the authors will examine outsiders' ability to imitate insiders in hope of extra earnings, measured as abnormal returns. Abnormal return is incurred in cases of trading in a public company's stock, made by individuals with access to non-public information (Keim 1983). A readers mind can possibly, and logically, be lead to illegal activities when first hearing about insider trading. This is a common interpretation and a consequence of a skein of insider trading scandals. There are numerous example of this in Swedish news reporting, including *Cevianmannen* and *Nordeamannen* (Svenska Dagbladet 2010). Both had acted on insider information and consequently made money from using non-public information. A common problem with the subject is the difficulty deciding whether it is illegal or legal, partly because of the unawareness if the insider person uses illegal or legal information. This study will only investigate the legal part of insider trading and the laws and regulations controlling this will be presented further in chapter 2.

1.2 Problem Discussion

Insider trading as an academic subject and research topic experienced a surge during the 1980's and numerous studies have been made in order to conclude if insiders' transactions, and earnings from them, are possible to quantify in order to gain abnormal returns. A keystone in the academic angle of insider trading is the theory of information asymmetry. George A. Akerlof wrote an article, "The market for lemons", that became a leading example of information asymmetry using a reference to customers buying cars without knowing all available information. Akerlof's simple illustration of car owners might be applied on any buyer on any market and so also buyers of stocks, referring to the previously mentioned outsiders and insiders. Assuming that outsiders, in case of information asymmetry, possess less information than insiders, it can be discussed if outsiders not naturally strive to reach the insiders' information position and moreover, how this can be done. From combining the theory of information asymmetry with the previous mentioned efficient market hypothesis, the research field of insider trading emerged.

The academic field of insider trading covers a wide range of perspectives and the lines of approaches are as many as there as there are reseachers. Seyhun, one of the most cited researchers within the field has shown that insiders earn abnormal return from their investments. However, insiders earning abnormal returns has been conclude in a broad spectrum of studies, whereas the focus more recently has shifted towards outsiders ability of earning abnormal return by imitating insiders. Lakonishok and Lee (2001) and Iqbal and Shetty (2002) have concluded that

the larger the company, the less abnormal return is possible to achieve when mimicking insiders transactions. Hence, the meaning of this is the smaller the company, the greater the possibility for outsiders to mimic insiders and thus retaining abnormal returns. An indication from these previous studies is that larger firms possibly possess a stronger form of information transparency and therefore suffers less from information asymmetry, which eliminates the possibility of earning abnormal return. Different subsamples have been tested in order to pinpoint which settings are most likely to provide evidence of abnormal return. One hypothesis that has been tested multiple times on multiple markets is whether a higher level of involvement with the company is synonymous higher abnormal return. Seyhun (1988) confirmed the hypothesis and established that CEO's earned significantly higher abnormal return than more remote insider (typically larger shareholders). More so, he found evidence that any rational investor could gain an edge by mimicking insiders and thus earning abnormal return. Once again Seyhun acceded to other researchers with the conclusion that the signals stemming from insider trading exist. Not only is it stated that insiders have the ability to use their advantage of information asymmetry in purpose of earning abnormal returns but also that outsiders have the ability to mimic insiders and by doing so earning abnormal returns.

In order to find the strongest signals leading to highest possible abnormal returns, researchers such as Seyhun (1988) and Jeng (2003) have applied an approach of identifying clusters from insider transactions. Detecting clusters, defined as transactions made by insiders in their company's stock during a specified period of time, and analyzing the clusters instead of every single transaction showed very strong indications of abnormal returns. By defining different subsamples, the authors of this study therefore decided to apply a clusters approach on the Swedish market.

Apart from the vast number of articles that has been published, an abundance of master theses have been written, of which many focus on the possibility to gain abnormal returns by mimicking insiders' buy transactions. However, there are two shortcomings of most studies, first one being the need to incorporate sale transactions, which should be considered of equal importance as purchase transactions. Second, most studies do not pay heed to transaction costs, that is the spread between buy- and sell prices and brokerage fees. The two shortcomings will therefore be taken into consideration in this study.

In ability to incorporate the different theories of for example information asymmetry and the efficient market hypothesis, the analysis of the Swedish stock market has been made on a deep

set of data. Transactions from all companies traded on the Large-, Mid- and Small Cap lists of NASDAQ OMX Stockholm are included in the dataset. Also, companies delisted any time during the time period 2005-2014 are incorporated when conducting statistical tests. The dataset of cluster transactions including both buy and sell transactions will moreover be tested in three different subsamples.

The following subsamples will be used in order to see seek an answer to under which conditions outsiders are most likely to experience abnormal returns:

- Size of firm
- Industry classification
- Phase of business cycle

The authors strive to, with help of the above-presented subsamples, answer the question of; are outsider investor who imitate insiders' buy- and sell cluster formations able to obtain abnormal returns, with empirical evidence from the Swedish stock exchange?

1.3 Purpose of the study

By using a classification of different kinds of insiders we wish to enlighten this area of study with empirics of how insiders on the Swedish Stock Exchange yield abnormal returns. Furthermore, and perhaps more importantly, we seek to introduce a classification of insiders transaction not used on Swedish data before with cluster transactions. Ultimately, the purpose is to see in what sense outside investor are able to earn abnormal returns by imitating the above-mentioned classifications of insiders.

1.4 Demarcations

The authors of this study have made the demarcation of only investigating companies listed on the Swedish market. The reason for not increasing the focus to several countries is that insiders' reporting duties differ due to differences in legislation between countries. Hence, a comparative study would not be meaningful, and the more narrow approach is justified by the depth of this study and its three subsamples.

1.5 Outline of the study

- The second chapter will provide the reader with necessary information of what an insider is, as stipulated by the law. The chapter also includes a summary of authorities governing the financial markets in Sweden .

Chapter 2 Laws and Regulations

- The chapter begins with a walkthrough of economic theories that are relevant for the study. They constitute of Random Walk, Signaling, Efficient Market Hypothesis & Information Assymmetry. A discussion of the theories will constitue the last part of the chapter.

Chapter 3 Theoretical Framework

- The fourth chapter will be devoted to previous studies conducted within the field of insider trading. What have been the most common results of previous research? The chapter will end with a discussion of the previous studies.

Chapter 4 Empirical Reserach

- Chapter five will begin with a sample presentation and what subdefinition that this study makes. An outline of the conducted event study will be given large space. The chapter ends with a discussion of the chosen methods and statistical tests.

Chapter 5 Methodology

- The sixth chapter starts with descriptives statistics consisting of a presentation of the signals that has been tested. Thereafter, the results from the conducted tests follow. The test results are presented in detail and followed by necessary analysis.

Chapter 6 Results and Analysis

- The seventh chapter is devoted to a thoruough discussion of the results of the study, and its contribution to prevailing literature. With a critical standpoint the authors seeks to answer the study's relevance and importance.

Chapter 7 Discussion and Conclusion

Chapter 2 Laws and Regulations

The second chapter aims at providing the reader with the necessary insight in terms of what an insider is and how the legislation defines the term. Also, the authorities that govern the Swedish capital markets will be covered. The legislative framework is a thorough subject, whereas this chapter will only cover the statutory rules of insiders' reporting duties and obligations. The relevance of this chapter should not be underestimated as the context of this study rests upon the legal framework of insiders.

2.1 What is an insider?

As outlined in the first chapter, an insider is a person with close affiliation to the management of a company. However, as cryptic as this may sound, there are two laws in Sweden that aim at clarifying what an insider is and what the consequence will be of breaking the laws governing an insider's rights and duties. These laws will be presented below. Also, it is important to keep in mind that anyone who is not defined as an insider becomes an outsider per se.

2.1.1 The Act concerning Reporting Obligations for Certain Holdings of Financial Instruments (SFS 2000:1087)

The Act concerning Reporting Obligations for Certain Holdings of Financial Instruments is the main legal source regarding the definition of what an insider person is. The law prescribes an insider as someone who is considered very likely to possess insider information of a company. It could either be from the persons' position within the company or its subsidiaries or any other form of affiliation with the company. (Finansinspektionen)
The following persons are classified as insiders by § 3 of the Act:

- A member or alternate member of the board
- An executive director within company
- Large shareholder (>10 % of the total stock)
- Auditors
- Others (family members)

Any closely related person to either of above-mentioned parties is considered of having equal insider position by § 5 (SFS 2000:187) and thereby stands up to the same reporting duty. Consequently, anyone who is engaged in the decision making of the company is regarded as an insider.

2.1.2 Market Abuse Penal Act (SFS 2005:377)

The Market Abuse Penal Act came into force in 2005 as a result of the perplexity of the by then outdated Insider's Penal Act (2000:186). The Market Abuse Penal Act is the most central law concerning insider trading and consists of the following parts (only those that are relevant for the study are mentioned): (Finansinspektionen)

- Prohibition on trading: Anyone who fulfills the requirements of being considered an insider with regards to the terms specified in section (§ 3 from SFS 2000:1087) is not allowed to buy or sell shares or any of its equivalents during a period of up to 30 days prior to any form earnings report or equivalent.
- Unauthorised disclosure of insider information
- Improper influence on share prices

Violating any of the above-mentioned criteria comes with punitive legal actions as outlined in chapter 2 § 1. As the data that this study intends to investigate consists of observations from 2005 and onwards no precautions have been made in order to facilitate the potential conflict of insiders' reporting obligations under the previous law.

2.2 Legal aspect of insider trading

Sometimes insider trading is a term that is associated with a confusion of concepts with the interpretation of insiders pursuing illegal actions. The correct definition is however a term that includes both legal and illegal conducts (Finansinspektion). One should note that this study does not seek to investigate the relevance of different definitions, as has been done before by Maug (2002). He conclude that insider trading greatly contribute to the market efficiency by providing outsiders with information. Previous studies have shown that illegal insider conduct is a widespread phenomenon and that there are a large number of unreported cases (Bhattacharya & Daouk). However, many scholars consider the surge of reported case in Sweden an effect of a restraint of the, at the time, lagging legislation. The monitoring of the Swedish

capital markets is collaboration between two authorities that co-function in order to make sure that laws are followed. The Financial Supervisory Authority has somewhat more of a monitoring obligation and the Economic Crime Authority has a broader scope with both investigation and prosecution units. Both will be briefly discussed below.

2.3 Sweden's Financial Supervisory Authority (Finansinspektionen)

The Financial Supervisory Authority is a statutory body established in 1991 that seeks to monitor all forms of market manipulation. The authority supervises companies on the Swedish financial market, aiming to encourage stability and efficiency in the financial systems as well as establishing customer protection. All firms offering financial services, requires a permit granted by the Financial Supervisory Authority. In addition to issue general advices and regulations, the Financial Supervisory Authority also controls compliance with the Swedish insider act. Regarding the Swedish insider act, they are responsible for controlling that companies obey the regulations stated. The Financial Supervisory Authority act preventive towards suspected offences and share price manipulations. The laws discussed previously mentioned constitute the framework that companies need to follow and if they are suspected not to, the Financial Supervisory Authority is responsible to investigate their acts. (Finansinspektionen)

2.4 Swedish National Economic Crimes Bureau (Ekobrottsmyndigheten)

The National Economic Crimes Bureau is a national authority dedicated to preventing all aspects of economic crimes and consists of a wide range of professionals, who jointly work together targeting specific target areas where insider-trading falls under what is called *Market abuse crimes.* The Economic Crime Authority has its equivalents in the Serious Fraud Office in the UK and Ökokrim in Norway, however with the clear distinction being that the Swedish counterpart has a much wider scope of actions and handles all investigations in the field of serious economical criminality. Normally, if the Financial Supervisory Authority suspects or discover plausible transaction, the case will be handed over to a special unit within EBM, who will further investigate and take the case to a prosecutor within the organization.

2.5 Discussion of the laws and regulations

The most important feature of this chapter is the definition of what an insider is. As stated in SFS 2000:1087, an insider could be anyone who possesses insider information of the company.

A valid resulting question is: what is insider information then? The answer to that is more ambiguous and not specified in the statute book. However, the most likely interpretation is that insider information is information that has significant influence on the future of the company and is to be regarded as information having an influence on the stock price (Finansinspektionen). However, some persons are always considered as being insider by Swedish legislation. These are members of the board, executives, large shareholders, auditors or anyone closely affiliated to the mentioned parties. It's the transactions made by these persons that function as a foundation for this study. On a separate note, it is worth to remember that only insider transaction that has been reported will be used in this study. There might a number of unreported cases, but as these cases are impossible to quantify they will not constitute any further research in this study

Chapter 3 Theoretical frame of reference

This chapter will describe the theoretical framework for the study. The most relevant theories will be described and discussed. The theories that will be covered are all classical economic theories and these theories will form the foundation for the continuation of the study. The chapter will cover the theories of information asymmetry, efficient market hypothesis, signalling and random walk, in the mentioned order. The chapter will end with a discussion of the relevance of the theories and the implications they might have on the insider trading environment.

3.1 Information asymmetry

Information asymmetry refers to a situation where one party in a transaction has more information compared to the other. The person with more information could easily create a harmful situation by using his or her advantage. In most situations, it is the seller that possesses more information than the buyer but it can also be the other way around. Information asymmetry might lead to two types of problems; adverse selection and moral hazard. The most classical example defining adverse selection is George A. Akerlof's article *"The Market for Lemons"* from 1970. One of the leading examples in the article depicts car owners who wish to sell their cars and naturally know more about that specific car than any possible buyer does. This leads to mistrust between the seller and the buyer followed by a bid from the buyer that reflects his negativity. When situations like this occur, sellers with good quality cars will not have any incentives to sell and a market with only bad quality cars will be created. This is an example of adverse selection. To conclude, the idea of information asymmetry is that different parties in a market have different levels of information (Akerlof 1970).

3.2 Market efficiency hypothesis

The second theory that is of relevance to this study is the hypothesis of efficient markets. Fama (1970) was the one who developed the Efficient Market Hypothesis and is known as the most famous researcher within the area of efficiency of financial markets and their constituents. However, previous to Fama developing his hypothesis, efficient markets were already being discussed under the name of Random Walk. The theory of Random Walk is a natural element of the study and will be elaborated further later on in the chapter.

Fama (1970) states in his hypothesis that it is not possible to systematically beat the market. This is because all information that is of relevance is already included in the current security prices and as a consequence, the market is therefore said to be efficient. According to Fama, efficiency of the market does however depend on the below mentioned conditions:

- That trading securities should be costless
- That all information should be available
- That investors should act rationally

The above-mentioned criterions are to some extent fulfilled in all markets but the question is rather to what degree of satisfaction they are fulfilled.

However, Fama also points out that this is an extreme null hypothesis, which he does not expect to be literally true, although it lives up to it rather well. To be able to break down the hypothesis he uses three different sub formations:

- Weak-form efficiency
- Semi-strong-form efficiency
- Strong-form efficiency

The meaning of the different categories is to be able to define at what level the efficient market hypothesis is insufficient.

Weak-form efficient market

Weak-form efficiency is the first degree of the different levels in the efficient market hypothesis, according to Fama (1970). The prices of securities in weak-form efficient markets are entirely based on historical information, which means that prices only reflect historical events. Therefore, it is not possible to analyse historical data to predict future price settings. When tests supported the efficiency hypothesis model at this level the attention was turned to the second sub device called semi-strong-form efficiency, also stated by Fama (1970).

Semi-strong efficient market

Fama (1970) states that the market is semi-strong if it can incorporate all the publicly available information, for example regarding announcements of stock splits, annual reports and new security issues. It assumes that the stocks can adapt quickly to new information. A rule of thumb whether the information is relevant or not is to determine if the stock price will be affected when the information is announced.

Strong-form efficient market

To fulfil the strong form of efficiency the stock prices have to reflect all information, meaning both public and private information, about a company. If this is fulfilled there is no possibility for the investors to obtain abnormal returns, including insiders with a lot of non-public information. Fama (1970) reflects that the concern for this level is whether any investors or groups possess monopolistic access to information that is relevant for the establishment of the prices.

3.3 Random walk hypothesis

As mentioned in the beginning of the chapter, the random walk theory is consistent with the efficient market hypothesis and it states that the stock market develop according to a random walk. Kendall (1953) was one of the earlier academics who studied the random walk hypothesis. In his examination about the price movements he came to the conclusion that the movements were very hard, almost impossible, to predict and that they could be described as a random walk in prices.

Fama discussed random walk in his 1970 article but his work started and was developed in his well-known article *"Random Walks in Stock Market Prices"*, published in 1965. In this article he came to the conclusion that it is not worth for investors to try to predict movements in the market if the hypothesis holds. Like in most theories, there is a crowd that not fully believes in the random walk theory. These professors, economists and investors have the faith that the market is predictable to some degree, meaning that prices move in trends and historical prices might be predicative in the sense that they foresee future prices. A professor believing in this angle of the theory is Andrew Lo who wrote the book *"A Non-Random Walk Down Wall Street"* in 1999. Professor Lo states in his book that the random walk hypothesis might be false based on the assumptions presented above. Lo's perspective is clearly supported by the title of his

book, a play on words with Malkiel's *"A Random Walk Down Wall Street",* written already in 1973. Malkiel's book took a more a supporting view of the random walk theory.

3.4 Signalling hypothesis

The theory of signalling can be located back to Spence (1973). He introduced and applied asymmetric information in decision making models. In his work he illustrated how useful the signalling theory is when optimizing solutions for signallers and for the ones receiving signals. The signalling theory refers to the problems in information asymmetry in markets.

John and Lang (1991) discuss insider holdings and points out that the best use of signals are when they are combined with other signals. John and Lang discuss the example that dividends can be good signals when they are combined with other market signals, for example combined with insider trading. Additionally, Del Brio and Miguel (2010), present that regarding information content about dividends changes, there is a reaction in stock prices.

According to Davies & Hillier (2008), there are several different ways of signalling. By adopting signalling, a company can both be perceived positively and negatively. Investigating dividends and the size of the dividends, the market interprets positive signals about steady growth in the company if the dividends are increasing but if the dividends are decreasing the market perceives negative signals. Taking on more equity in a company might signal that the equity is overvalued and therefore sending negative signals. On the contrary, if a company takes on more debt it will send out positive signals.

3.5 Discussion of the theoretical framework

In this chapter, classical economic theories that are relevant for the study have been presented. The key concepts of the mentioned studies are certainly not new, but they form a foundation from which most research takes it point of departure. Practical examples of studies and the implications of the literature will be covered in the next chapter. One of the key concepts in the process of determining whether abnormal returns exist or not, and why abnormal returns occur, is the information asymmetry. When looking at this study's different subsamples, a central aspect will be to what extent the availability of the firms' information is available to the market and its participants. The degree of transparency will likely differ between different sized companies and then naturally the level of information asymmetry. A likely step would therefore be

to discuss how efficient the market is. It will also be applicable for the different industry classifications and the phases of the business cycle.

Fama's efficient market hypothesis has, as presented above, different outcomes depending on the effectiveness of the market. Keep these different forms of market efficiency in mind as they will be discussed in combination with the results in chapter 6. Also, the information asymmetry theory is of relevance, as this conception will be tested in regards to the effectiveness of the market participants.

Chapter 4 Empirical Research

In this chapter the reader will be able to get an understanding of previous empirical research of insider trading. The subject of insider trading has been around for approximately half a decade and only the most relevant articles for this study will be discussed. As with many several other fields of contemporary research, there is a distinct focus on studies conducted on the U.S. market. This study has adopted a Swedish framework and to depict the full picture, international studies will be discussed as well.

4.1 U.S.-studies

Jaffe (1974) was one of the first researchers who examined the possibility of earning an abnormal return by mimicking insiders' transactions. During the 1960's and 1970's all insiders were obliged to report their holdings and changes in their respective portfolio to the authorities. Twice a year the *Official Report of Insider Holdings*, containing all insider data, was released. Jaffe studied all transaction made by the insiders of the 200 largest companies of the Chicago Research in Security Prices (CRSP) during the period 1962-1968. His main contribution to the field of insider trading was the introduction of a new tool of measuring insider trading. Jaffe manually checked the dataset and defined months during which trading activity took place. Hence, his final sample consisted of months with buying activity on one hand and month with selling activity on the other. By using CAPM[1] as a model to predict the return of the market and running a regression on the sample, Jaffe concluded that insiders could earn abnormal returns whereas outsiders imitating the insiders' transaction would not profit by doing so. The only exception to where outsiders could earn an abnormal return was companies with what he defined as intensive trading, where the insider on average held the stock for up to 8 months. 8 months was a shorter period of time than what insiders held their stocks for on average. The difficulties for outsiders to profit over the rest of the sample owes to the fact that transactions costs accounted for a larger sum than what was possible to yield from mimicking the insiders' transactions. Notably, the results he obtained goes directly on the contrary to the hypothesis of the efficient market, since insiders were able to earn abnormal return.

[1] CAPM is a widespread method of computing the return of a security or portfolio where the expected return equals the risk-free rate plus a risk premium.

Seyhun, who arguably is the most cited researcher within the field of insider trading, has published two papers that stand out. In his first paper, which also happened to be his PhD dissertation from 1986, Seyhun presented evidence that insiders possess an advantage against outsiders in terms of how well they can predict future returns. This result corresponded to Jaffe's previous conclusions of insiders. Furthermore, what Seyhun did was that he identified different kinds of insiders, were he made a distinction between (1) Officers, (2) Directors, (3) Officer-directors, (4) Chairmen of board directors and (5) Large shareholders. By classifying insiders in subordinate group based on their respective level of insight in the firm, Seyhun was able to test the hypothesis of information asymmetry. The data contained all insider transactions on the U.S. market between the years 1975-1981. The conclusion was the same as Jaffe had made. The obtained results confirmed his hypothesis that depending on the level of insight in the firm, the abnormal return varies. Higher ranked insiders (directors and officers) earned a significantly higher level of abnormal return than lower ranked insiders (officer-directors). In line with the hypothesis of different levels of information, Seyhun concluded that insiders tend to make larger transaction when they have an information advantage. However, when looking at outsiders ability to mimic insider transactions, he concluded that transactions cost made it unprofitable and hence, outsiders were not able to earn abnormal returns.

In his 1988 study, Seyhun further developed his earlier hypothesis of insiders earning abnormal returns. He developed a framework where he tested if aggregate buying in the same stock by many different insiders equalled to a higher return than if only one purchase had been made. This is known as cluster transactions. He defined cluster transactions as months with more than 3 transactions of the same kind (either purchases or sales) in the same stock made by different insiders. The result showed that the following sixty days – after the last of the aggregated purchases had occurred - were characterized by a statistically significant rise in the stock's price. The opposite hypothesis was also proven to hold, that is, aggregated sales in the stock were followed by an abnormal decline in the stock. Seyhun also investigated whether the overall market condition influenced the return of insiders. The results clearly indicated that insiders of smaller firms made stock transactions based on factors deriving from the specific firm and not the condition of the overall market. Also, the abnormal return stemming from insiders in smaller firms was constantly positive, independent of the overall market conditions.

Lakonishok and Lee (2001) studied insider trading in the context of how the market reacts to insider transactions. The sample consisted of all companies traded on the NYSE, AMEX and NASDAQ and the sample period was 1975-1995. Their main conclusion was that the market movement stemming from insider transactions was on average very little. However, and more interesting, is the fact that they were able to determine that insiders had a contrarian approach to their investing on an aggregate level. This is in line with Seyhun's inference. Furthermore, Lakonishok and Lee were able to determine that insiders in smaller firms were more actively trading the stock than insiders in larger companies. Lakonishok and Lee propose the solution that smaller firms tend to be less efficiently priced than larger firms, and hence a possibility to exploit the mispricing existed. Lakonishok and Lee further concluded that purchases made by insiders were informative in the sense that they predicted future returns. However, insider sales were proved not to be as strong in predicting future stock movement.

Lin and Howe (1990) examined the profitability of insiders in firms traded on NASDAQ. They concluded that insiders closer to the firm (such as CEO) have more relevant information and more importantly, access to valuable information compared to insiders more remotely located to the firm (large shareholders). In their results they confirmed their hypothesis since CEOs earned a higher abnormal return. The link seemed to hold as more remote insider earned lower abnormal returns. One reason to this is that the CEO has an insight in the firm's day-to-day operations that the large shareholder might lack. Ultimately, after taking transaction costs into account, Lin and Howe found evidence that the semi strong market hypothesis by Fama holds as outsiders are unable to earn abnormal return by imitating insiders' transactions.

Iqbal and Shetty (2002) conducted research with the aim to examine whether insider transactions and stock returns have a relationship of causality at the firm level. They studied the years 1988-1998. Due to the angle, they had the possibility to observe if the trading is related to firm-specific information. The result showed, both on aggregate and firm level, a negative impact of stock returns on future insider transactions. The fact that the impact is negative is most likely because insiders purchase after the price decreases and sell after the price increases. Hence, insiders are prone to invest when the general view, and thereby the price, of the company is priced in a way that do not correspond with the insider's personal view.

Piotroski and Roulstone (2005) find strong evidence that insider purchases have a positive relationship to future earnings. They present an idea of insiders being both contrarian investors, that is, they go against outsiders' view of the value of the firm, as well as trading on future news. The latter indicates that a skewed information asymmetry exists, which proves why insiders are able to earn significant returns. Furthermore, Piotroski and Roulstone find a stronger relationship between insider purchases and stronger future earnings in smaller firms due to the lower degree of information available about these firms. In line with Seyhun (1988), Piotroski and Roulstone see a stronger relationship between executives and future earnings (rather than lower-ranked insiders and future earnings).

4.2 International studies

Pope, Morris and Peel. (1990) were able to conclude Seyhun's (1986) proposal of insider earning abnormal return, but on London Stock Exchange. The study was the first of its kind outside of the U.S. and the obtained result confirmed Seyhun (1986) and Jaffe (1974) previous findings. The authors were able to conclude a significant size of firm effect. Insiders of larger firms were less prone to show any form of abnormal returns, whilst insiders of smaller firms achieved a statistically significant abnormal return.

Eckbo and Smith (1998) conducted a study of insider trades performed on the Oslo Stock Exchange with time scope 1985-1992. They adopted a time-weighted model. The result turned out in a slightly different fashion than the previously presented studies. Eckbo and Smith were not able to prove any relationship between insider transactions and positive abnormal returns at all. Instead the result showed a somewhat negative return from insider transactions. In addition, they found that the portfolios formed from all insider transactions were outperformed by the portfolios handled by mutual funds on the same stock exchange.

Del Brio and Miguel (2010) studied the Spanish stock market, but chose a somewhat different scope than most other studies. They focused on the signalling aspect of different kinds of actions, and what market reaction to expect. The signalling effect of insiders' transactions was one. The reaction of insiders who sold their stocks turned out to be rather negative. This result comes quite intuitively, but when combining the signalling effect of insider sales with a shift downwards in the company's dividend policy, the result showed much higher impact. The authors thereby conclude that it is relevant to look for not only insider transaction, but also insider

transaction in combination with other corporate actions with signalling value. Also, the opposite relationship was studied. When insiders bought the stock, the market interpreted it as a positive signal and stock prices rose.

Dickgaisser and Kaserer (2009) performed a study on the German stock market with the aim of looking further into the efficient market hypothesis. Their scope was to seek into whether or not outsiders would be able to imitate insiders' transactions in order to earn abnormal returns. When looking at the reaction to the announcements of directors' transactions they discover a large post-event excess return. However, the results show that outsiders' possibility to earn abnormal return decreases and disappears as soon as transaction costs are taken into account. Therefore, the obtained results do not interfere with the efficient market hypothesis, which thereby is said to hold. They also show that the idiosyncratic risk makes it costly for outsiders to mimic the transaction and therefore poses a threat to the strategy. To sum up, the study provides evidence that stock prices reflect publicly available information in an efficient manner.

TABLE 4.1 SUMMARY OF PREVIOUS STUDIES

Authors	Country of study	Publication and Year	Years studied	Topic of Research	Main conclusion
Jaffe	United States	Journal of Business (1975)	1962-1968	Informational content of insider trading.	Insiders might earn abnormal returns, but outsiders are hindered by transaction costs.
Seyhun	United States	Journal of Financial Economics (1986)	1975-1981	The possibility of earning abnormal returns, both for insiders and outsiders.	Insiders are able to obtain abnormal returns. More so if the insiders are higher ranked. Transactions costs prevent outsiders form earning abnormal returns.
Seyhun	United States	Journal of Finance (1988)	1975-1981	Level of insight amongst different kinds of insiders.	Pattern showing that insiders with day to day engagement with firm earn higher return. Also strong correlation between cluster transactions and abnormal return during upcoming 60 days.
Eckbo & Smith	Norway	Journal of Finance (1998)	1985-1992	Insiders' ability to earn abnormal returns.	Slightly negative correlation between insider purchases and stock return with regards to firm specific factors.
Lakonishok & Lee	United States	Review of Financial Studies (2001)	1975-1995	Insider transactions and market reaction.	Insiders seem to be informative when studying purchases. Sales show no significant connection with regards to declining stock prices.
Del Brio & Miguel	Spain	European Financial Management (2010)	1992-1996	Signalling effect from corporate actions.	Strong signalling effect from insider sales, which corresponds to negative stock return. The informational content of corporate actions such as dividend cuts and earnings announcement plays a crucial part of predicting future stock movement.
Lin & Howe	United States	Journal of Finance (1990)	1975-1988	Level of insight amongst different kinds of insiders.	Insiders (CEO) closer to the company have greater access to important information than those who are more remotely connected (large shareholders).
Piotroski & Roulstone	United States	Journal of Accounting & Economics (2005)	1995-2000	Psychology behind investment undertaken by insiders.	Strong evidence between insider purchases and future earnings. Insiders tend to be contrarian investors.
Pope, Morris & Peel	United Kingdom	Journal of Business, Finance and Accounting (1990)	1982-1988	Abnormal return amongst insiders.	Insiders are able to earn abnormal return on London Stock Exchange. Larger firms tend to show a lower level of abnormal return than smaller firms.
Dickgiesser & Kaserer	Germany	German Economic Review (2010)	2002-2007	Outsiders' ability to imitate insider transactions.	Insiders (directors) are able to achieve abnormal return. Outsiders are not, largely owing to the fact that transactions costs eats up the profit. The efficient market hypothesis is said to hold.
Iqbal & Shetty	United States	Journal of Economics and Business (2002)	1990-2000	Relationship between insider trading and stock returns.	Insiders tend to buy and sell the stock based on personal views. Transactions often occur after a surge or plunge of the stock price.

4.3 Discussion of previous research

As the field of insider trading is a vast topic and more than a handful papers have been written, only the ones the authors deem to be of most relevance has been discussed above. Table 4.1 provides a quick overview and is intended to help the reader navigate between different studies. It further functions as a summation of the articles that has been reviewed in this chapter.
Most of the above-mentioned studies, performed on various markets, have shown the same results, which are insiders earning abnormal returns by using their superior access to information. These findings seem to be universal and not a result of country specific features. This is something that Jaffe (1974), Seyhun (1986) and Lin and Howe (1990) amongst other have proved. However, when consideration of factors such as transaction costs and idiosyncratic risk have been taken into account, the results become somewhat mixed. Any practical impact of a study unequivocally includes these factors to conclude if outsiders are able to earn abnormal return by mimicking insiders.

Eckbo and Smith's (1998) research on Oslo Stock Exchange proves to be the only study where the originators were unable to provide evidence of abnormal return on behalf of insiders. In terms of how outsiders are able to imitate insiders' transactions and by doing so earning abnormal return, the results differ. Jaffe (1974) proved that outsiders would be able to earn abnormal return in companies with intensive trading, even after consideration of transaction costs was made. Seyhun (1986) found it impossible, as the transaction costs accounted for a too large portion. One obvious reason to the contradictory findings is the different time scope used, as well as the difference in the classification of companies.
Dickgiesser and Kaserer's (2009) results from the German market are in line with Seyhun's findings, where they conclude that the efficient market hypothesis holds.

An interesting aspect of literature on insider trading is how it has been proved that higher-ranked insiders tend to earn a larger degree of abnormal return that lower-ranked. This finding is not seen as surprising since the CEO is indeed very well informed about projects undertaken by the company. Furthermore, a general feature that is constant throughout many studies is that the smaller the company the larger possible abnormal return. Several authors discuss this phenomenon as the result of information asymmetry across the array of investors. This comes quite

intuitively as smaller firms are less well-known and are not covered in the same extent as larger companies generally are in terms of publicity.

As many of the mentioned studies have been performed on the American market, the results cannot be said to be fully replicable to the Swedish settings. This is partly due to the different legal settings between countries and partly due to rules regarding the reporting duty of insider holdings. Arguably, one could raise concerns over the most frequently cited studies (Jaffe 1974 and Seyhun 1986) as they are now stricken in years. However, this could also be seen as a strength since the results are still valid.

Most of the relevant studies have adopted an event study approach, where only minor distinction are made between the different studies. It comes quite intuitive as the area of study has generally been the actual insider transaction, an event whose impact is easily measurable with the event study framework. Therefore, this study will consequently adopt the very same method of studying the event. A thorough dissection of the methodology used for this study will be covered in chapter 5.

Chapter 5 Methodology

The fifth chapter will present the reader to important methodological aspects of the study. The chapter will begin with an introduction to the field of a quantitative study and the deductive approach, then continuing with a thorough presentation of the data and its characteristics. Furthermore, a lot of space has been given to the identification of clusters. Following, the chapter will continue with a full cover of the event study framework, as it is the preferred method to examine cross sectional events. The chapter will end with a run-through of the test statistics and their appropriateness.

5.1 Choice of scope

There are two main categories investigated when deciding method for thesis writing; qualitative method and quantitative method. Backman (2008) describes the distinction between the two different methods. The qualitative method is an interpretive research strategy using words and observations rather than numbers and statistics. The latter is therefore closely related to the quantitative study framework. A quantitative study experiences a theory examination whereas a qualitative study undergoes a grounded theory. Since this study has a testing approach, it will have a deductive approach. With the orientation explained for this study, a quantitative study was relevant due to the focus on reliable data, statistical tests, event studies and the structured outline. Bryman and Bell (2003) depictures essential keywords within the field of quantitative studies that can be replicable on this study. The notions of specific factors, such as causality, replication and measurements are crucial and put aside the critique against quantitative frameworks. The critique, also mentioned by Bryman and Bell (2003), concerns the fact that a scientific model can study the social reality and scepticism is raised. To build a model within the field discussed in the study, a comprising of including signals from insider behaviour and actions, it requires involvement of a scientific model testing statistics.

5.1.1. The deductive approach

By adopting a deductive approach, the normal course of action consists of six steps where the first step evolves from existing literature within the area of interest. The existing literature functions as a foundation from which the hypothesis is deduced. Based on existing theories within the field of study, one or several hypotheses are formulated. The third step is the process of gathering data needed to study the subject. Normally, a framework consisting of relevant test statistics is set up that aim at testing the deduced hypotheses. After having structured the model, the hypotheses will either be confirmed or rejected by the output of the model. Depending on the outcome, the previous theory might be subject to change after new findings have been deemed scientifically acceptable.

FIGURE 5.1

THE DEDUCTIVE APPROACH

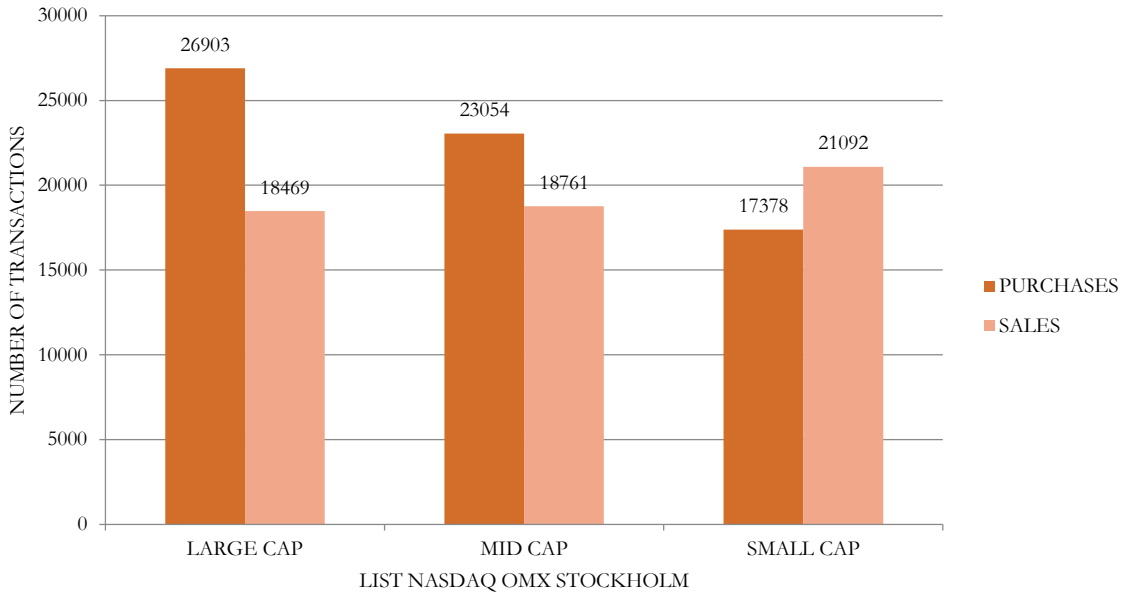
SOURCE: BRYMAN & BELL (2003)

5.2 Presentation of the study

The following part of the chapter will present the sample included in the study, which methods used to identify clusters and end with a presentation of the three subsamples made to formulate the hypotheses.

As previously mentioned, all insiders are obliged to report their holdings (as discussed in chapter 3), to the record Swedish Financial Authority (*Finansinspektionen:* hereinafter referred to as FI). However, as this study focuses on the years 2005-2014, all insider transactions executed during the time period constitute the original data sample. During these 10 years, the total number of transactions made were 125 657. In other words, all of these transactions make up the total data sample. However, in the same fashion as Jaffe (1976) and Seyhun (1988), this study seeks only to investigate insider transactions that are the results of actual investment decisions made by the individual insider persons. Therefore only transactions made in the company stock are considered. Consequently, exercised stock convertibles, options, allocations or stocks received through incentive programs are not included, as they are generally the result of factors not originating from active investment decisions.

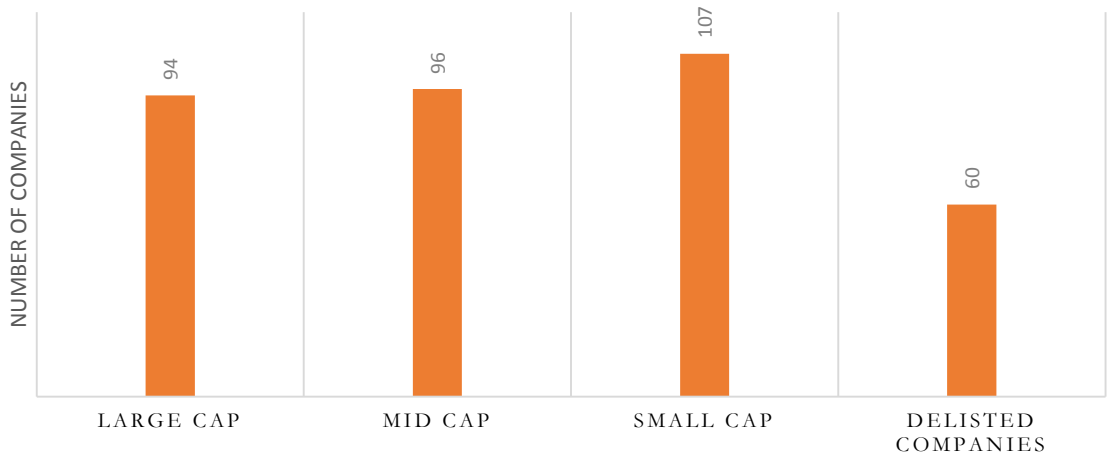
FIGURE. 5.2 INSIDER TRANSACTION ON NASDAQ OMX STOCKHOLM 2005-2014



SOURCE: NASDAQ OMX STOCKHOLM

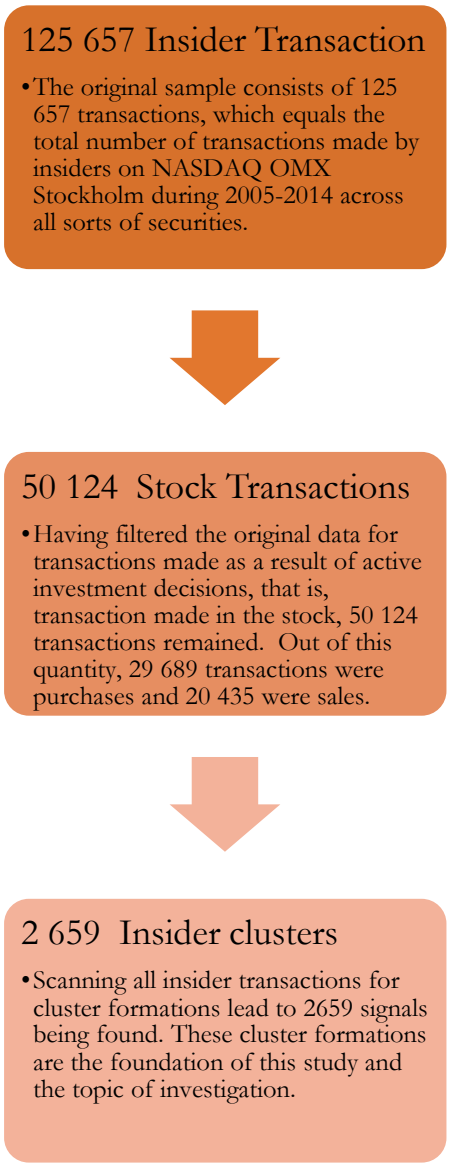
Furthermore, Gregory et al. (1994) conclude that including incentive based transactions will lead to a reduced effect when measuring the abnormal return. Approximately 50 124 insider transactions remained after having filtered the total data sample. Out of the remaining 50 124 transactions, 29 689 transactions consisted of insiders who purchased the stock and the remaining 20 435 transactions were insiders who sold the stock. Not all companies have been listed for the full 10 years that the study is examining, which is a natural result of initial public offerings on NASDAQ OMX Stockholm. Naturally, these companies are also included in the total sample. In accordance with this, delisted companies that for any reason were subject to delisting during the studied time period are also included. The main reason to include the delisted companies is to avoid the survivorship bias, which is a form selection bias where only prosperous companies that were able to "survive" are included. On a separate note, this is normally a more serious problem when conducting a study with a longer time horizon. The total number of companies included in the study equals 357, of which 60 are no longer listed. Figure 5.3 shows the total number of companies included. The observant reader might come to the conclusion that there are more shares included in this study than there are companies listed on NASDAQ OMX Stockholm. That is a valid point. However, the reason for this is that there is a difference between number of companies and number of shares listed on OMX NASDAQ Stockholm since some companies have both class A and class B shares listed. A complete list of all included companies can be seen in Appendix 2. Companies included in the study.

FIGURE 5.3
COMPANIES INCLUDED IN THE STUDY



SOURCE: EK & ERLINDER(2015)

FIGURE 5.4
THE RELATIONSHIP BETWEEN INSIDER TRANSACTIONS AND CLUSTERS



SOURCE: EK & ERLINDER (2015)

5.3 Identifying cluster transactions

In order to conduct an event study it is a necessity to identify the events the study aims to examine. The focus of this study is clusters, which are transactions executed by several insiders within a limited period of time. In order to facilitate for the reader, the following text will function as a manual of how a cluster is defined. In accordance with previous research (Seyhun and Sjöholm and Skoog), this study defines a cluster as being a predefined period of time when three or more insiders of the company either bought or sold the stock. Note that the transactions must be of the same kind in order for the transactions to be considered a cluster, that is, either three purchases or three sales. Seyhun (1988) applied and defined the cluster formation as three transactions in the same stock made within a month. However, this study restricts the time scoop to a week, which equals five days of trading (as no trading occurs during weekends per se). This approach is the same as Sjöholm and Skoog (2006) applied when studying cluster transaction of exchange traded stocks. What differentiates this study is the scoop of looking at outsiders' ability to earn abnormal return by imitating insiders, following the signal of clusters. Therefore, the actual event date of this study constitutes of the date when the information that a cluster formation has been completed is publicly released.

Once again, this study is not limited to only buy transactions; it includes sale transactions as well.

The clusters have been conducted from both Large-, Mid- and Small Cap-companies listed on Nasdaq OMX Stockholm. Moreover, this has led to a larger sample to test from and due to the size of the sample the analyses will be subject to a more robust base from which the analyses are made.

5.4 The execution date versus the release date

Insiders are by law obliged to report any change in their holdings to FI within five days after the transaction was made. Thereafter, FI releases all insider transactions in the daily Insider Report, which is a publicly available report downloadable from FI and provided by several news feed agencies such as Cision and FinWire. During the years of 2005-2014, 125 657 insider transactions were made and reported by the FI.

After having structured a model to identify cluster transaction, the total data sample was manually checked. One cluster transaction renders one signal and each signal is considered as one

event. Note, that it is neither the first nor the second insider transaction that functions as the actual event, but the third. As the study aims exploring the possibilities for outsider to abnormal return, careful consideration has been taken to when the insider transactions were made public, as this will naturally function as the event day. Intuitively, any observant reader will understand that the release date will not be the same as the transaction date, i.e. the day when the third insider transaction took place, as there is a natural lag in the reporting. Once again, it is the release date of the third insider transaction date that constitutes the actual event, as this is the day when the market participants are made aware of the trading activity.

5.4.1 Release of the daily insider register

As has been pointed out earlier, FI keeps track of all insider transactions in Sweden. FI releases the Insider Report each weekday at 17:30, a time that has been moved from 14:30 which used to constitute the time when the list was released. The trading activity of NASDAQ OMX Stockholm closes at 17:30 which makes it impossible to trade on the information from the list since it is released when the stock market has closed. The information asymmetry between market participants has thus declined due to the change in policy. However, during the years investigated in this study, 2005-2014, the insider register was released at 14:30 and therefore the mid prices of stocks for the day that the transactions were made public has been used in this study. If one would conduct the same study as this one but with a time scoop including 2015, it would be necessary to use the following days opening prices since that would be the first possible chance outsiders have to act on the information of insider transactions. The purpose of the study is to investigate outsiders' possibility of achieving abnormal returns, hence the decision of using mid prices for the day the transactions are published is taken to further validate the results.

5.5 Subsamples

After having studied earlier research and set up a couple of important criterions of what might be relevant to study three subsamples of the original sample of 2 659 insider clusters were made. The subsamples will be presented and discussed in detail below. Each of the different parts of the subsamples constitutes one portfolio, while purchases and sales portfolios for all subsamples are being studied at individual basis. The results from the subsamples are presented in chapter 6.

5.5.1 Subsample 1: Size of Firm

The first subsample of the original sample constitutes of a subsample being made on the basis of the firms' respective size. This division comes quite intuitive as previous research (Seyhun 1986, Lakonishok and Lee 2001 and Wong, Chuk and Wu 2000) suggest that there exist a difference in the ability of earning abnormal return depending on firm size. Even though the focus of the mentioned studies is to see whether insiders are able to earn abnormal return and not outsiders, the findings present an interesting angle. It seems that large- and mid-sized companies are subject to a higher level of analysis from outside stakeholder, such as analysts. As a consequence, the results do not show any clear sign of possibilities to earn abnormal return, something that the authors suggest is a consequence of non-existing access to superior information amongst the insiders. However, smaller firms show a distinct difference and offer the opportunity to earn abnormal returns. Seyhun (1986) ascribes this possibility to a significantly higher degree of information asymmetry, and a natural cause of less attention being drawn to smaller companies from investors. En clair, insiders on average in smaller firms tend to hold a clear information advantage against the uninformed outside investor. To what extent might these findings be applicable on firms traded on OMX Stockholm? This study applies a subsample of the firms included, depending on their respective size. Simply by using NASDAQ OMX Stockholm's three different lists, the Large-, Mid- and Small Cap lists, the division is made. However, there are a couple of underlying factors that the reader should be aware of. Firstly, the Large-, Mid- and Small cap lists were introduced during October 2006. Up to that date, the A-list, O-list and Attract 40-list had been used. However as this study examines companies and transactions that were made during 2005-2014 and consequently have data observations from the years when the previous classification was still in use, the natural choice has been to include the companies on the respective list where they were introduced following the new classification in October 2006. Secondly, all companies that have been delisted, are incorporated in the

study on the lists were they most recently traded prior to the delisting. Thirdly, and perhaps more important, several firms have changed lists during the 10 years between January 1st 2005 and December 31st 2014. The lists are being revised every year at year-end and firms that do not meet the minimum threshold in terms of market capitalization are subject to either a downgrade or upgrade in terms of listing (Nasdaq OMX Stockholm). The practical implications of this revisions to this study is that a firm might have been a component of the Small Cap list at one point in time and at a later stage a part of the Mid Cap list. This is simply an example to illustrate the importance of classifying the companies correctly. The authors have decided to look at every single event separately and classify the event according to what list the firm belonged to during that specific date. Both purchases and sales will be included, however there will be a separation between the two in terms of portfolio belonging. The reason for the separation between purchases and sales is to determine what type of transaction show the highest level of signalling value.

Based on the arguments listed above, subsample 1 while henceforth be:

Large Cap:	Firms with a market capitalization of €1.000.000.000 or above
Mid Cap:	Firms with a market capitalization between €1.000.000.000 - €150.000.000
Small Cap:	Firms with a market capitalization below €150.000.000

5.5.2 Subsample 2: Industry classification

The second subsample of this study is a subsample of the included companies based on their respective industry classification. Cheauk, Fan and So (2005) investigated insider activity on the Hong Kong Stock Exchange during1993-1998 in terms of different industry classifications. They studied both purchases and sales and concluded that insiders across all industries proved to be successful regarding their ability to earn abnormal return. However there was a clear distinction between different industries. Insiders of financial companies were the most successful, earning on average an abnormal return of 2,8% during the 20 days that followed the transaction, while insider belonging to the group Hotels showed almost no signs of abnormal returns. An interesting inference by Cheauk et al. is that insider sales turned out to a more powerful signal than purchases, something that the authors ascribed to insiders constantly timing their sales at high prices. The implication of this might be that certain industries are characterized by a higher level of information asymmetry. While Cheauk et al.'s results are not applicable to Swedish settings, the underlying idea of studying different industries is well-founded.

The subsample of the companies in this study will be based on the Industry Classification Benchmark (hereinafter referred to as ICB). ICB is a global classification standard that most stock exchanges throughout the world have adopted. Originally, the taxonomy was launched by Dow Jones and FTSE in 2005 and the underlying idea is to simplify the comparison of companies, active within the same field. All companies on NASDAQ OMX Stockholm are divided into 10 industry groups based on their respective core business (ICB Benchmark *Industry Structure and Definitions).* Table 5.1 shows the total number of companies within each of the groups and the groups' percentage of all companies. As can be seen, NASDAQ OMX Stockholm is dominated by Industrials, a group that make up roughly one fourth of all companies. Also, Financials and Technology companies are large, while there are only two companies across all lists that belong to Utilities.

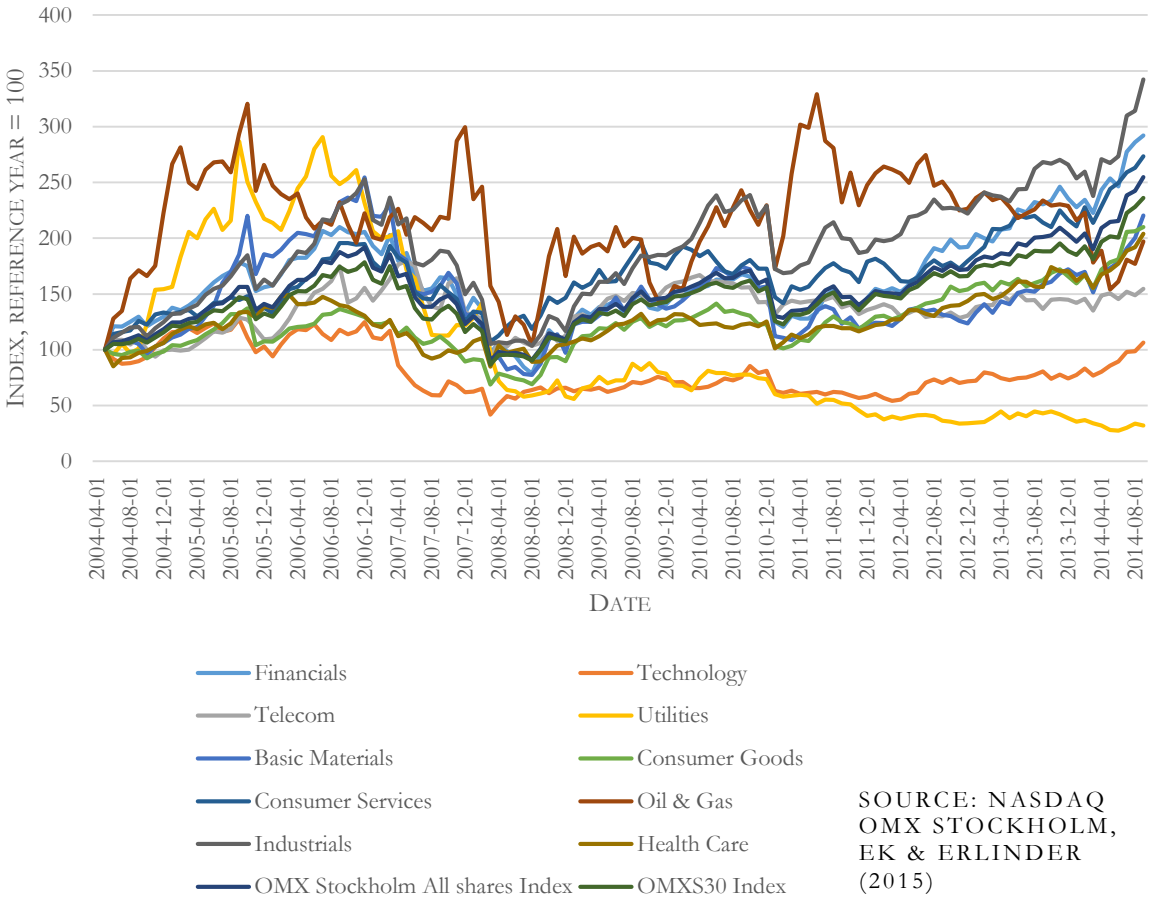
TABLE 5.1 COMPANIES PER INDUSTRY CLASSIFICATION

Group	Number of companies	Percentage of total number of companies
Financials	56	17,55%
Technology	56	17.55%
Basic Materials	22	6,89%
Consumer Services	26	8,14%
Oil & Gas	8	2,49%
Industrials	77	24,13%
Utilities	2	0,62%
Consumer Goods	31	9.80%
Health Care	34	10,65%
Telecom	7	2,18%
Total	319 companies	100%

SOURCE: NASDAQ OMX STOCKHOLM, ICB

As the different groups are regressed on individual basis, different indices are used to compute the CAAR for each group. Please note that only nine groups are present in this study, as the 10th group, Utilities and its constituents did not provide any cluster formations during the studied time period. The distribution of clusters will be discussed further in section 6.1 of chapter 6. Figure 5.5 on the next page show how the different industry segments have developed during the years included in this study. It becomes evident that there has been a clear difference in terms of how well the different groups have performed on an aggregated level, that is, all the components of the different groups together.

FIGURE 5.5 ICB INDUSTRY CLASSIFICATION, MONTHLY PRICES



SOURCE: NASDAQ OMX STOCKHOLM, EK & ERLINDER (2015)

The second subsample of the sample will consequently be divided based on the above mentioned ICB industry classification and include the following groups:

- Financials
- Telecom
- Basic Materials
- Consumer Services
- Industrials
- Technology
- Consumer Goods
- Oil & Gas
- Health Care

5.5.3 Subsample 3: Phase of business cycle

Previous studies of insider trading have shown that insiders' trading activity follow the patterns of traditional business cycles. Also, insiders tend to time their transaction quite well, leading to higher return than what an uninformed investor might achieve. This hypothesis was tested by Lakonishok & Lee (2001), who showed that insiders were very heavy sellers the month preceding the Black Monday in 1987[2] and thus managed to realize profits from stock holdings. Abumustafa and Nusair (2011) studied how the activity amongst insider differs depending on the general climate of the market, that is, times of growth and expansion or times of contraction and recession. The general conclusion that they were able to draw was that insider sales increased substantially in times of poor performance of the economy as a whole (most notably the months after September 2007 which officially marks the start of the latest financial crisis). The informativeness of sales were thus a stronger signal in times of recession.

The companies listed on NASDAQ OMX Stockholm are obviously of Swedish origin, but as Sweden as a whole is a very export oriented country the companies are dependent on how the global economy develops. Figure 6.5 shows how the GDP of Sweden, the EU-15 countries (the 15 members of the European Union prior to the accession in 2004)[3] and the OECD countries have developed between 2005 and 2014. By looking at the graph, it becomes evident that the Swedish economy has performed better than the OECD countries on average and much better than the EU-15 countries. A business cycle is generally divided into phases of expansion and phases of contraction and when classifying the years between 2005 and 2014 the authors of this study have chosen to compile an average of: 1. The GDP of Sweden, 2. The GDP of the EU-15 countries and 3.the GDP of the OECD countries. By doing so, 6 years and 6 months were classified as years of expansion and 3 years and 6 months years were classified as years of contraction. Table 5.2 on the next page further clarifies which years and quarters of a year that are classified as either expansion or recession.

[2] Black Monday refers to the 19th October when stock markets across the world crashed and substantial value was erased in the matter of hours (Browning 2007)

[3] The EU-15 countries include: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden & United Kingdom (OECD: *Glossary of Statistical Terms*)

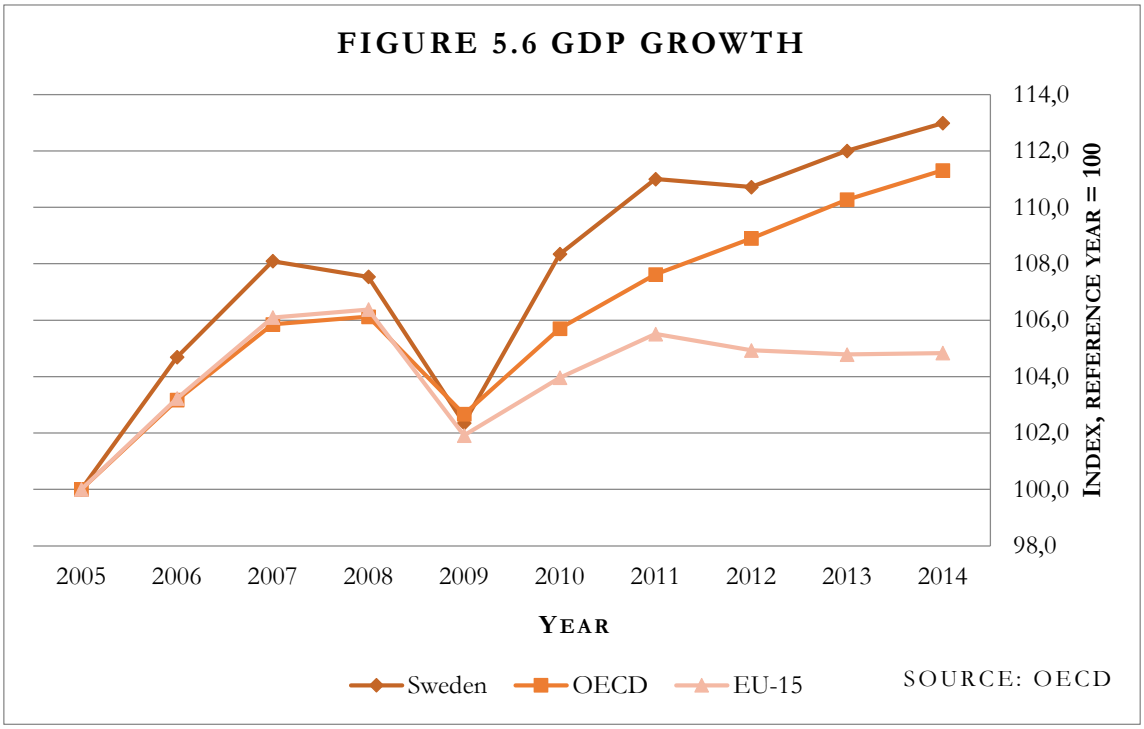


TABLE 5.2

DEFINITION OF SUBSAMPLE 3: PHASE OF BUSINESS CYCLE

Phase of business cycle	Years and Quarters	Total
Expansion	2005, 2006, 2007 (Q1&Q2), 2009 (Q3&Q4), 2010, 2012 (Q3&Q4), 2013 & 2014	6 years 6 month
Recession	2007 (Q3&Q4), 2008, 2009 (Q1&Q2), 2011, 2012 & (Q1&Q2)	3 years 6 month

SOURCE: EK & ERLINDER (2015)

The third subsample of the data sample will be a subsample defined of what stage of the business cycle the insider transactions and the cluster formations were made. The subsample will be based on the arguments outlined on the previous page on consist of the following two groups:

- Transactions made during years of **Expansion**
- Transactions made during years of **Recession**

5.6 Formulation of hypotheses

The hypotheses below is intended to conclude the discussion given over the last pages. The aim of this study is to investigate whether outsiders are able to earn abnormal return by imitating cluster formations or not. The sample has been separated into three subsamples, as presented in sections 5.5.1-5.5.2. The hypothesis is the same in each subsample. As customary in all research, the null hypothesis attempts to capture that no significant variation exists in the sample.

The hypothesis will thus be:

H_0 : Outsiders are not able to earn abnormal return by imitating cluster formation, formed from insider transactions.

H_1 : Outsiders are able to earn abnormal return by imitating cluster formations, formed from insider transactions.

5.7 The process of gathering and organizing data

5.7.1. Insider- and stock data

All insider transactions have been subtracted from Millistream, a software product developed by the financial data provider Millistream Market Data AB. Millistream automatically extracts all data from the Swedish Financial Authority's *Register of insider transactions*, which is a publicly available database with all insider transactions saved. As part of the collaboration between the authors of the study and Redeye (read appendix 3 for more information of the collaboration), the authors have been able to retrieve the data concerning all insider transactions from Millistream, albeit it being a service exclusively provided to financial institutions. The data concerning stock and index prices have been gathered from Thomson Reuters Datastream, a reliable provider of stock quotes and financial news. The retrieved data from Thomson Reuters Datastream constitute of daily stock quotes of all included stocks, both companies that are currently listed on either of Large-, Mid-, or Small cap of NASDAQ OMX Stockholm and companies that have been delisted during the period. It is of importance to stress that the delisted companies, 60 in numbers, makes the total sample less vulnerable to survivorship bias. The survivorship bias constitutes an important risk as only including successful companies that have

managed to survive for the studied 10 years would lead to a systematic error. Hence why, companies that for various reasons have not been listed for the whole period are included as well. In practice, this means that some companies have disappeared and yet some have been listed at a later stage and as a consequence, have not been included for the whole period of 10 years. Also, the data regarding index prices has been retrieved from Thomson Reuters Datastream.

5.7.2. Discussion and general critique of the data collection

The data regarding insider transactions that have been processed in this study's tests have been collected from Millistream. Millistream is a highly considered feed provider of financial data, and albeit the data being of secondary source, the level of reliability should be high. However, crosschecks of the samples have naturally been made by the authors to authenticate the data. In doing so, the insider transactions received from Millistream have been checked against the data provided from FI, the primary source of insider data. While going through the sample, no misleading information was found. All stock prices have been downloaded from Thomson Reuters Datastream, with access kindly provided by the School of Economics and Management. In the case of daily stock prices, the verification of the data to discover potential sources of errors is difficult. However, the data has been checked against NASDAQ OMX Stockholm's database containing all historical prices of the traded assets included in this study. This crosscheck was performed manually and the original data from Datastream did not show any sign of errors or missing values.

5.7.3 Discussion of the use of stock prices

The stock prices that are used throughout this study are daily adjusted prices, meaning that intraday movement is not included. Intuitively the price might not be the best price that the outsider will be able to buy or sell the stock at, as stock prices always fluctuate during a trading day and not seldom trade at a both higher and lower price compared to the last price of the day. However, important events such as stock splits and dividends are incorporated in the prices. Also, as this study focuses on outsiders' ability to earn abnormal return, the mid-price of all stock quotes has been used throughout the entire study.

5.7.4 Organization of the data

As much of the organization of the data has been done manually, that is, manually scanning the more than 100 000 insider transaction made during 2005-2014, the process is inevitably vulnerable to human errors. Naturally, several measures of precautions have been taken to minimize any kinds of misclassifications resulting from errors. However, as the data has been cross-checked several times to spot mistakes, the possible sources of errors are at a level that is deemed to be of acceptable standard and not influencing the results.

5.8 Literature

As the first step of the deductive approach when conducting a study of this kind is to examine previous literature, much attention has been paid to carefully review previous studies and academic papers. Most articles have been retrieved by searches in either of Scopus or Libhub. The authors have sought to use reliable sources and esteemed academic journals, for example Journal of Finance and Journal of Financial Economics.

5.8.1 Possible sources of biases

Both the authors behind this study are students at the School of Economics and Management in Lund and as consequence of the similarities surrounding their respective backgrounds the study rests upon the foundation of how the authors are able to critically select and examine literature. Much focus has been on reviewing previous literature within the field of insider trading and building a framework from which this study's position in existing research has found its place.

5.9 Transaction costs:

Transaction costs are the costs that arise when stocks are bought and sold on the stock exchange. As a topic of research, transaction costs have been investigated since the middle of the last century. Already in 1968, Demsetz presented a study focusing on transaction costs, his study becoming one of the more famous ones in the area. According to Demsetz, transaction costs can be defined as expenses incurred when securities are bought or sold, meaning a cost exchanging ownership titles. The definition *transaction costs* include both commission fees and bid-ask spreads. Looking at the bid-ask spreads, Demsetz highlights the need for the seller to be compensated for providing immediacy on the stock market to the buyers, that is the spread

between ask and bid prices. Additionally, he argues that transaction costs are lower when there is a large amount of shareholders which leads to the conclusion that the bid-ask spread should to be lower in larger firms than the smaller ones. Mcinish and Wood (1992) conclude a number of variables that are determinants of bid-ask spreads. These variables include averaged number of shares traded, the volume and the number of transactions. Furthermore, Mcinish and Wood propose the use of mid-values, which is an average between bid and ask quotes, when conducting studies such as this one. However, the second component of the conception transaction cost is the commission that brokers charge customers when executing transaction.

TABLE 5.3 COMMISSION FEES SWEDISH BROKERS

Brokerage Firm	Commission Fee	Minimum Commission
Aktieinvest	0,055-0,130%	39-99 SEK
Avanza	0,034-0,250%	0-99 SEK
Danske Bank	0,10%	79 SEK
Handelsbanken	0,09%	99 SEK
Länsförsäkringar	0,09%	99 SEK
Mangold	0,035-0,150%	49-99 SEK
Nordea	0,00%	59-99 SEK
Nordnet	0,034-0,150%	39-99 SEK
Nordnetdirekt	0,15%	7 SEK
SEB	0,09%	69 SEK
Skandiabanken	0,044-0,250%	8-75 SEK
Swedbank	0,030-0,090%	59-99 SEK
Average	0,087%	68,40 SEK

SOURCE: FINANSPORTALEN

The table above presents the commission that a set of brokers charge their customers. As can be seen, the commission normally consists of two parts, first part being a flexible quote depending on the total size of the transaction. The average floating commission runs up to a total of 0,087% of the total value of the transaction. The right hand column summarizes the set minimum commission that brokers charge per transaction. This minimum commission is independent of the size of the transaction and functions as a floor in terms of how much the broker

charges its customers. The first thing that becomes evident when looking at the table above is the differentials amongst the different brokers. Therefore, to include commission fees in the model would not show the true cost for the investor as this cost differs substantially depending on the broker and also on the frequency of the activity of the investor. Active investors tend to have more advantageous terms and hence lower commissions. (Avanza)

Therefore, the incorporation of transaction costs in this study is limited to the use of mid-values of stock prices when conducting the tests.

5.10 Event studies

The following section of the chapter will go over the event study framework which is the method of choice when measuring the impact of one or several events, as is the case in this study. The general outlines of event studies dates back to the 1930s, however this study will follow the guidelines outlined by MacKinlay in *"Event Studies in Economics and Finance"* (1997).

Conducting an event study involves gathering financial market data and is well known in finance theory and often associated with mergers and acquisitions and issuing new debt or equity. However, according to MacKinlay, event studies have also been used in terms of legal cases investigating the impact on firm value when the regulatory environment has changed. The central part of conducting an event study is the measurement of an abnormal stock return. Abnormal returns are defined as the difference between the actual return and the expected normal return as stated by a model calculating a normal return.

Event studies possess a long history and one of the first to examine the subject was Dolley in 1933. He analysed the price effects of stock splits by studying the nominal price changes when the split occurred. MacKinlay (1997) describes seven different steps necessary when conducting an event study. All of the seven steps will be described and discussed over the next pages with regards to the respective steps' implication in this study.

1. Event definition
2. Determine selection criteria
3. Abnormal and normal returns
4. Definition of estimation window
5. Definition of testing framework
6. Presentation of empirical results
7. Interpretation and conclusions

Event definition

According to MacKinlay's (1997) seven-step model, the initial task is to exactly define the event that is of interest. In most event studies, the event consists of a date, but sometimes a month or hour is chosen. This study will adapt the conventional method of using specific dates as events. An interesting factor to take into consideration in this study is the importance of choosing the correct dates as events. The discussion of what dates constitute the event dates in this study was given in section 5.4.

Choosing an event window can result in both a short period and a long period timeline. The study has investigated both options for different reasons. Kothari and Warner (2004) suggest that the event window should not be longer than 10 days or the power of the model might decrease. Also, previous research (Dickgiesser and Kaserer 2010) have shown that outsiders' possibilities to earn abnormal return diminish quite quickly after the signals (that is the information of insiders' transactions) have gone public. Consquently, this study will adopt the use of multiple event windows, ending 1, 2, 5, 8 and 10 days respectively after the event date.

Determine selection criteria

This study investigates Large, Mid and Small Cap-companies listed on NASDAQ OMX Stockholm. The sample data covers all trading days between January 1st and December 31st between the years 2005 and 2014. When the first outline to the study was written, a limitation to only include the Small- and Mid Cap-companies was originally decided. However, in order to broaden the sample and to be able to test the hypothesis of smaller firms showing larger possibilities to earn abnormal return by imitating insiders, it became evident that Large Cap-companies also should be part of the total sample.

Abnormal- and normal return

The abnormal return is the difference between the realized return of the stock and the expected return of the stock if the event would not have taken place. The idea is to isolate the effect from the specific event from general movement not originating from the event that is the focus of the study. In order to be able to determine the abnormal return of the stocks after the insider cluster has been formed, one has to incorporate the expected return of the market. Hence, MacKinlay (1997) proposes the use of either the *constant mean return-model* or the *market model*. While

the former assumes a constant return of the market over time, the latter attaches great importance to a linear relationship between the return of the market and return of the individual stocks. Furthermore, an important feature of the market model to keep in mind is the constant betas used throughout the event window.

Estimation window

The estimation window is the period of time that elapses up to the first day of the event window. When calculating abnormal return with the market model, the estimation window functions as a time frame during which the parameters for the stocks the study seek to investigate is calculated. Wells (2004), state that the time length of the estimation window should be long enough to assess the normal price action pattern of the studied securities. Most event studies adopt the use of an estimation window of between 120 – 180 days. MacKinley (1997) suggests that 120 days is the minimum amount of trading days necessary to include in order to be able to calculate a fair value of the normal stock movement. Thus, this study will use 130 trading days as estimation window.

Testing framework

The fifth step in an event study, according to MacKinlay (1997), is to test the framework for the abnormal returns. It is of great importance to consider and fully determine the null hypothesis. This study has three sub hypotheses that will be tested independent of each other. The three subsamples are covered in section 5.5.

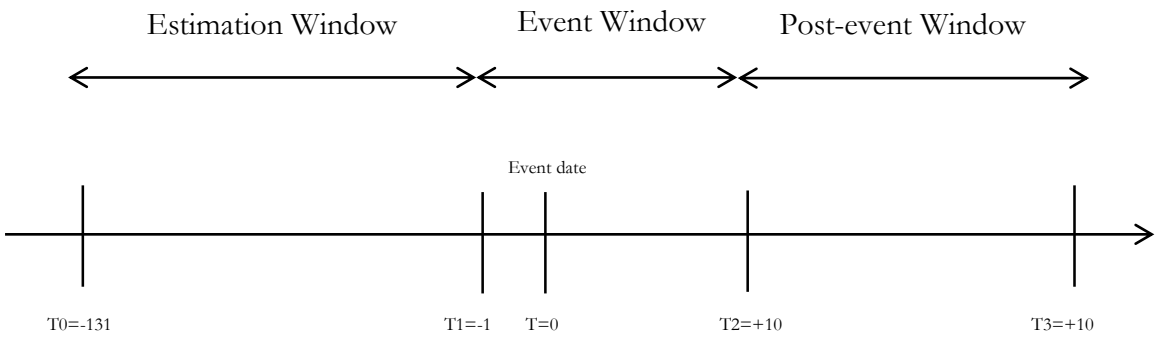
Presentation of empirical results

MacKinlay (1997) stresses that empirical results might be influenced by one or two firms and hence lead to a skewness of the results. However, the amount of firms is rather big in this event study. Therefore, it should not be of importance or a problem for this study. The results from this study will be presented in chapter 6.

Interpretations and conclusions

In an ideal event study, an understanding of the sources will follow the empirical results and consequences of the effects in the event study. In terms of concluding the study, it is therefore important to interpret and to discuss the results obtained.

FIGURE 5.7 OUTLINE OF EVENT STUDY



SOURCE: MACKINLEY (1997)

5.11 Critique against the use of the event study approach

Albeit event studies being the common approach when studying a specific event's impact on stock quotes et cetera, there are several concerns that need to be raised. Firstly, a longer event window makes the results more vulnerable to noise caused by other factors than the studied event, which in this case are the clusters transactions. Several authors have investigated this; amongst others Armitage & Barry (1994) who conclude that longer event windows lead to mis-interpretations as external factors, not caused by the observed phenomenon, tends to influence the obtained conclusions. More so, they propose a maximum of 30 days as event window in order to avoid the mentioned bias. This is in line with previous research conducted by Fama (1996) who stress the fact that when measuring abnormal returns, the methodological framework is dependent on the studied period. When measuring abnormal returns for a longer period of time, model specifications differ with regards to when measuring abnormal returns for shorter periods. A more common approach used when studying an event's impact for a longer

time horizon is the Buy-and-Hold strategy. However, as the longest event window chosen in this study is 10 days, the buy-and-hold strategy is not germane to the study and will not be discussed further.

5.12 Sample period

As previously presented, the time period for this study will be the 10 years beginning January 1st and ending December 31st, thus including all insider transaction undertaken during any of the included 2520 days of trading. The choice to use a 10-year study window was made to broaden the credibility of the results as well as giving the authors further opportunities to study the sample in detail. It also opens up for a subsample of transactions made during the different phases of a full business cycle. This subsample is one of three that this study seeks to investigate and is further presented in section 5.3.3. Category 3 Phases of Business Cycle.

5.13 Indices used to calculate the normal return

As this is study has split the main sample into three subsamples in order to study the sample at a more detailed level, different indices have been used to calculate the normal return of the stocks. This has been done in order to further increase the level of accuracy of the models.

Subsample 1: Firm Size

The first subsample seeks to shed light on the opportunity for outsiders to earn abnormal return across portfolios based on firm size, as measured by market capitalization. When testing the different portfolios the index used in the market model differs according to what portfolio being tested. Table 5.3 below shows what indexes are used for what portfolio.

TABLE 5.4 INDEXES FOR SUBSAMPLE 1: FIRM SIZE

Portfolio	Index used in the market model	Constituents of the index
OMX Large Cap	OMXS30	Market weighted share index consisting of the 30 most actively traded shares on the Stockholm Stock Exchange.
OMX Mid Cap	OMXSMCPI	Index consisting of all companies listed on OMX Stockholm's Mid Cap segment, currently 96 shares.
OMX Small Cap	OMXSSCPI	Index consisting of all companies listed on OMX Stockholm's Small Cap segment, currently 107 shares.

SOURCE: NASDAQ OMX STOCKHOLM

Subsample 2: Industry Classification

As previously described in section 5.5.2, the second subsample is based on the ICB classification standard and divides the total sample into groups depending on the companies' core business. Table 5.4 below presents the different indices used when calculating the cumulative abnormal return for each portfolio in subsample 2. As can be seen in the right column, the components of the different indices differ quite substantially in terms of the number of constituents. Please note that there is 10 groups according to the ICB classification standard, however one of the groups (Utilities) include companies that did not show any cluster formations during the studied period and is henceforth disregarded in this study.

TABLE 5.5 INDEXES FOR SUBSAMPLE 2: INDUSTRY CLASSIFICATION

Group	Market model used for each group	Constituents of the index
Financials	OMX Stockholm Financials PI	56 financial companies are currently included in the group.
Technology	OMX Stockholm Technology PI	56 companies are currently included in the group.
Health Care	OMX Stockholm Health Care PI	34 companies are currently included in the group.
Consumer Services	OMX Stockholm Consumer Services PI	26 companies are currently included in the group.
Consumer Goods	OMX Stockholm Consumer Goods PI	31 companies are currently included in the group.
Telecommunications	OMX Stockholm Telecommunications PI	7 companies are currently included in the group.
Basic Materials	OMX Stockholm Basic Materials PI	22 companies are currently included in the group.
Oil & Gas	OMX Stockholm Oil & Gas PI	8 companies are currently included in the group.
Industrials	OMX Stockholm Industrials PI	77 companies are currently included in the group.

SOURCE: NASDAQ OMX STOCKHOLM

Subsample 3: Phase of Business Cycle

For the third subsample, which has been discussed in section 5.5.3, the index used in the market model has been an index that includes all stocks on NASDAQ OMX Stockholm. The reason for this is that when conducting the statistical tests for the portfolios (transaction made during expansion years respective transactions made during years of recession) all companies, with no regards to firm size, are included. To prove the robustness of the market model and to avoid consequence of misspecification in the model, the study computes the third subsample with both AFGX[4] and OMXSPI[5].

[4] Sweden's oldest index, formed in 1937. The index consists of 192 shares from NASDAQ OMX Stockholm and is weighted according its constituents market capitalization. (Affärsvärlden)
[5] Index containing all shares trading on NASDAQ OMX Stockholm. The index is market weighted. (Nasdaq OMX Stockholm)

5.14 Equations used to determine relevant test statistics

The following section of the fifth chapter will cover all relevant statistical tests that have been conducted. The equations for each test are explained in order to facilitate the understanding of somewhat difficult formulas.

5.14.1 Simple Net Returns

For all events that the study seeks to investigate, the event study framework suggests that one should calculate the simple net returns of every single event. The return, R, of firm *i* at time τ is calculated by the following equation:

EQUATION 5.1 SIMPLE NET RETURN

$$R_{i,\tau} = \frac{P_{i,\tau}}{P_{i,\tau-1}} - 1$$

SOURCE: MACKINLEY (1997)

5.14.2 Logarithmical Returns

However, as a short-term approach to the event study is used, MacKinley (1997) provides reason as to why the logarithmical returns is more appropriate to use than simple net returns. En clare, the main reason that MacKinley gives is it that using logarithmical returns is more preferable when conducting event studies with shorter time horizons, because the returns are less prone to be effected by skewness. Logarithmical returns are the same as continuously compounded returns and are calculated with the following formula:

EQUATION 5.2 LOGARITHMICAL NET RETURN

$$r_{i,\tau} = \ln(1 + R_{i,\tau}) = ln(P_{i,\tau}) - \ln(P_{i,\tau-1})$$

SOURCE: MACKINLEY (1997)

5.14.3 Calculating abnormal returns

After the returns of the single events have been determined, the next step is to calculate the abnormal return, which is the return that originates from the studied event. The goal is to see what impact the actual event has on the stock price and to understand to what extent the stock's movement is just a cause of natural market movement. The abnormal return should therefore

be interpreted as the isolated effect of the event and the corresponding stock movement at time τ. The logic behind the calculation of the abnormal return is to subtract the expected return given the absence of the event from the actual return. The following equation is used to calculate the abnormal return:

EQUATION 5.3 ABNORMAL RETURN

$$AR_{i,\tau} = R_{i,\tau} - E\left[R_{i,\tau} \middle| \Omega_{i,\tau}\right]$$

SOURCE: MACKINLEY (1997)

5.14.4 Cumulative abnormal return

The cumulative abnormal return is the sum of all singe abnormal returns as calculated above. This is done in order to capture the combined impact of all events across the sample. As previously discussed, this study has adapted 5 different time length of event windows and consequently 5 separate CARs have been calculated. Also, CAR's for all different portfolios (groups of subsamples) are calculated. The test statistic is given by:

EQUATION 5.4 CUMULATIVE ABNORMAL RETURN

$$CAR_i(\tau_1, \tau_2) = \sum_{t=\tau_1}^{\tau_2} AR_{i,t}$$

SOURCE: MACKINLEY (1997)

5.14.5 Cumulative average abnormal return

The cumulative abnormal return is the cross-sectional average of each of all the CAR's for the different event windows. This measure is of great importance of the result as all statistical tests that are conducted, are based on the CAAR measure (see next section of this chapter for a description of the relevant tests). CAAR is calculated with the following equation:

EQUATION 5.5 CUMULATIVE AVERAGE ABNORMAL RETURN

$$\mathrm{CAAR}(\tau_1, \tau_2) = \frac{1}{\mathrm{N}} \sum_{\mathrm{i}=1}^{\mathrm{N}} CAR_i(\tau_1, \tau_2)$$

SOURCE: MACKINLEY (1997)

5.15 Statistical tests

The following part of the chapter will provide the reader with information what tests that have been conducted. There are several different statistical tests to choose from when examining the data. The factors to take into consideration when choosing relevant tests are based on the characteristics of the data and what one wishes to study (Bryman and Bell 2003). This study presents mainly three different tests; Student's t-test, Corrado's Rank test and Boehmer, Musumeci and Poulsen's t-test (hereinafter referred to as Boehmer et al.). The uncertainty about normal distribution in the different samples reinforces the purpose of conducting more than one test. In order to make sure the interpretations of the results rests upon solid foundations, a normality test has been conducted on all subsamples. The normality test explores the distribution of the variable of interest and will provide invaluable insight into which statistical tests is relevant for each subsample. The normality test of choice of this study is the Shapiro-Wilk test, which will be discussed further in section 5.14.6.

5.15.1 The meaning of cross-sectional tests and analyses

A cross-sectional analysis, made by an investor, analyst or portfolio manager, focus on a comparison between a company and the industry it operates in or its industry peers. When implementing a cross-sectional analysis, the aim could be to identify the company's value, competitors or the operational efficiency. In the end there is a hope and aim to make the best investment or to know how to further develop a company using the different comparison metrics provided. When analyses contain cross-sectional data, meaning that it is a type of data collected observing several different objects, for example firms, at the same period of time or with no regard to differences in time. (Eventstudytools).

The above definition of cross-sectional tests and analyses can easily be applied on this study's material. Observing several cluster formations within different industries is a typical example of cross-sectional data. To be able to consider all of the provided data, it is necessary to use a tool functional and robust enough.

5.15.2 Significance tests

Hypothesis tests are normally divided into two different group; parametric and non-parametric. The parametric tests are recognized with normal distribution, homogenous variance and the mean used as a central measurement (Körner and Wahlgren 2006). In a non-parametric test, the distribution and variance can be any and instead of the mean used as a measurement the median

is more commonly used. In research in general and this study in particular, a parametric test is often followed by a non-parametric test to support the findings and to rule out that the results are due to outliers. (Eventstudytools).

5.15.3 Student's t-test

Student t-test, also known as only the t-test, is a well-known and common parametric hypothesis test used to measure the significance in materials. It requires the observations to follow a normal distributed path and that is also the most important assumption. The t-test relies on a hypothesis and the aim is to test if the null hypothesis is supported and further on if two sets of data are significantly different from each other. If it not is normally distributed, the test becomes unreliable and the answers have to be found elsewhere (Körner and Wahlgren 2006).
Due to the basics of the t-test and its use across the academia, it was a natural choice for the authors to include the test when searching for relevant tests. The student's t-test will function as a base from the hypotheses are tested, if the sample meets the assumptions of normal distribution that is. The test statistic for the Student's t-test when for H_0: CAAR = 0 is given by:

EQUATION 5.6 STUDENT'S T-TEST

$$t_{CAAR} = \sqrt{N}\,\frac{CAAR}{S_{CAAR}}$$

SOURCE: MACKINLEY (1997)

5.15.4 Boehmer, Musumeci and Poulsen's standardized cross-sectional t-test

To solve the problem where data becomes too affected by the event-induced volatility changes, Boehmer et al. introduced a robust standardized cross-sectional t-test in 1991. Boehmer et al. tests for the null hypothesis that the cumulative average abnormal return is equal to zero. Boehmer et al. found that when even the smallest increase in volatility in prices surrounding the event day occurs, most common methods reject the null hypothesis of non-abnormal returns. As a solution to this problem, they proposed that the variance of average abnormal return should be estimated from the cross-section of the event date prediction error. However, in the case of lower-tailed hypothesis, the test rejects the null hypothesis too often.

For the same reason as Boehmer et al. created the test, this study will include the test in order to further enhance the possibilities to deliver a robust result. The Boehmer et al. test can be seen as a good complement to the other parametric test, Student's t-test. The test statistic is given by the equation below, when testing for H_0: CAAR = 0.

EQUATION 5.7 BOEHMER ET AL.

$$z_{BMP} = \sqrt{N}\,\frac{\overline{SCAR}}{S_{\overline{SCAR}}}$$

SOURCE: BOEHMER ET AL. (1991)

5.15.5 Corrado's Rank test

On contrast to Student's t-test and Boehmer et al.'s t-test, Corrado's rank test is a non-parametric test, which means that test is useful when the requirements of the normal distribution are not met. Corrado's rank test tests for abnormal security-price performance in event studies and the null hypothesis is that the average abnormal return is equal to zero. The test is conducted by ranking all abnormal returns for the complete sample of firms for both the estimation- and event period. In relation to the t-test, Corrado argues that his rank test is better specified under the null hypothesis and more powerful under the alternative hypothesis. To implement the rank test, Corrado explains in his article that it is first necessary to divide and transform each firm's abnormal returns into ranks over the combined period. In the conducted test, a comparison of the ranks in the event period for each firm is made. The test statistic for the test is given by:

EQUATION 5.8 CORRADO'S RANK TEST

$$t_{rank} = \sqrt{L_2}\left(\frac{\overline{K}_{T_1,T_2} - 0.5}{S_{\overline{K}}}\right)$$

SOURCE: CAMPELL AND WASLEY (1993)

5.15.6 Shapiro Wilk test for normality

As we cannot assume that the average abnormal returns for all subsamples are normally distributed, a test for normality has been conducted on all subsamples. The aim of scanning the data for normality is to check whether a parametric- or a non-parametric test is more appropriate. Parametric tests, such as Student's t-test automatically assumes that each category of the independent variables is normally distributed while non-parametric tests, such as Corrado's Rank Tests do not make any assumptions of the distribution. To test the sample for normal distribution, a test for normality is performed. When conducting a test for normality, there is a couple to choose from. These are Kolgomorov-Smirnov, Shapiro-Wilk, Anderson-Darling and Liliefors tests (Razali et al. 2011). However, according to recent research (Thode 2002 and Razali et al. 2011) the most reliable and commonly used test is the Shapiro-Wilk test. The Shapiro-Wilk test tests the distribution of the data under the null hypothesis that the data is normally distributed and presents the probability of normal distribution at chosen significance level. The importance of using a normality test to be able to detect non-normal distribution is dependent on size of the sample. Elliot (2007) proposes that it is always beneficial to ascertain the distribution of the data, unless the sample size is very larger (above 1000). In this study, the sizes of the different subsamples range from 30-594, which means that the sample benefits from performing a normality check. The chosen level of significance for Shapiro-Wilk will throughout this study be the 5 % level.

The test statistic for Shapiro-Wilk is given by:

EQUATION 5.9 SHAPIRO-WILK

$$W = \frac{\left(\sum_{i=1}^{n} a_i x_{(i)}\right)^2}{\sum_{i=1}^{n}(x_i - \overline{x})^2}$$

SOURCE: SHAPIRO & WILK (1965)

The Shapiro-Wilk test is the most powerful when the variables are continuously measurable. The reason to include a test for normality in this study is to further enhance the reliability and eventually rule out the possibility of make wrong assumptions from the inferential statistics. The test for normality has been performed in IBM's statistical program SPSS. Furthermore, the appropriateness of the normality test has been crosschecked by looking at the skewness and kurtosis of each subsample. According to Doane & Seward (2011), both the kurtosis and the skewness measure should be as close to zero as possible. However, in reality most data are skewed. When checking the data in this study, the manual check for skewness and kurtosis show no deviation from what was established from the Shapiro-Wilk test.

5.15.7 Discussion of problems occurring from the cross-sectional correlation of abnormal returns

Kolari & Pynnönen (2010) have written extensively on the topic of falsely rejecting the null hypothesis, when it in fact is valid. In this case, rejecting the true null hypothesis would lead to an error of the first kind and meaning that the full extension of abnormal return across the sample is not reflected in the result. To further validate the results of this study, an adjusted t-test called *Kolari & Pynnönen* has been used when calculating the abnormal returns.

Chapter 6 Descriptive Statistics and Results

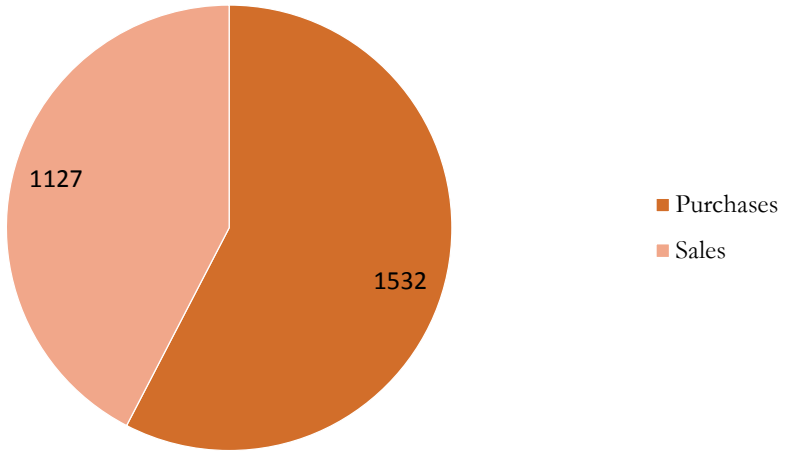
This chapter starts with a presentation of the signals (cluster formations) used in the testing of the sample. After that, the obtained results will follow. Each subsample will be presented before an analysis follows. Thoughts connected to the results and the reasons for them will be stated.

6.1 Descriptive Statistics

This part of the chapter will be devoted to descriptive statistics. As previously stated, the purpose of this study is to test how cluster formations generated from insider transactions function as a signal for an outsider investor to earn abnormal return by imitating the clusters. The outline of how clusters are detected was covered in section 5.3. It might be relevant to once again go over the way the clusters are formed in order for the reader to get an understanding of the results that will follow. Clusters are formed when three or more insiders either buy or sell the stock within a limited period of time (limited to 5 trading days). It could be the case that three insiders make the transactions on the very same day. However, in most cases the transaction are made scattered during the 5 trading days that functions as delimiter in terms of how much time that is allowed to elapse from the first to last third transaction. To further clarify, the definition of a week is not dependent on calendar weeks, but a rolling period of 7 days, starting from the day the first transaction is made. Also, it is the date when the insider transactions are made public that are measured in this study. If any obscurities remain regarding the formation of clusters, please read section 5.3.

After having scanned the 125 657 insider transactions for clusters, rendered from purchases and sales in the stock, 2 659 signals were found. The signals and how the division between the 3 subsamples looks like will be presented below in figures 6.1 – 6.6.

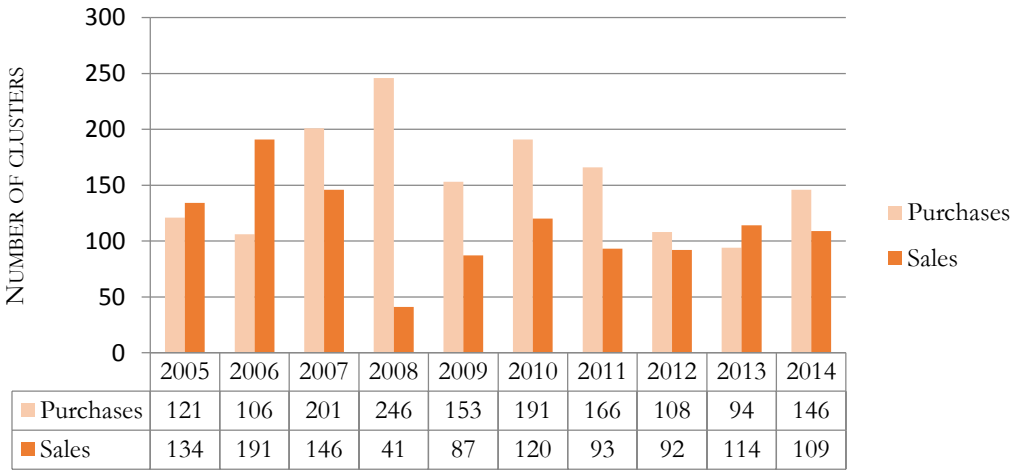
FIGURE 6.1
TOTAL SAMPLE OF CLUSTER SIGNALS



SOURCE: EK & ERLINDER (2015)

As can be seen in figure 6.1, the total number of cluster and hence the sample that will be tested in this study consists of 2 659 cluster formations. One cluster formation equals one signal and the proportion between purchases and sales is almost 4:3. 1532 purchase formations and 1127 sale formations were detected for all firms during the time period between January 1st in 2005 and 31st of December in 2014. Figure 6.2 shows how the clusters are divided during the 10 year period. One can see that insiders formed purchase clusters very frequently during 2008, 246 compared to 41 sales cluster for the full year. Also, 2006 shows divergence from the overall pattern, with more sale cluster generated than ditto purchases.

FIGURE 6.2
CLUSTER SIGNALS PER YEAR



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Purchases	121	106	201	246	153	191	166	108	94	146
Sales	134	191	146	41	87	120	93	92	114	109

SOURCE: EK & ERLINDER (2015)

FIGURE 6.3
SUBSAMPLE 1: SIZE OF FIRM

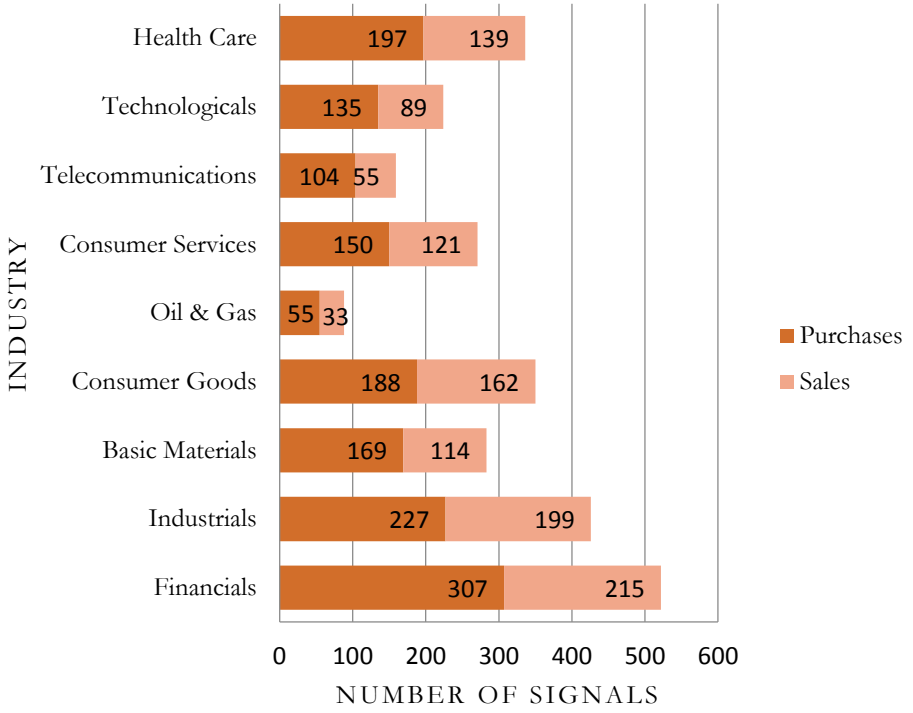
	Purchases	Sales
Large Cap	414	397
Mid Cap	524	481
Small Cap	592	249

SOURCE: EK & ERLINDER (2015)

Figure 6.3 shows the distribution of signals found for the respective groups in subsample 1. Most notable is the fact that Small Cap-companies show the largest number of purchase signals among the three groups whereas for sales, Small Cap-companies produces the fewest signals. Large Cap-companies provided almost the same amount of clusters, 414 purchases and 397 sales. The number of signals of each of the groups above will constitute the samples that will be tested for subsample 1.

Figure 6.4 on the next page shows the division of clusters found for the respective industry groups. The different groups show large differences in the number of obtained signals. This was however in line with what to expect, since certain groups consists of a larger number of companies than others. For example, the groups Financials, Technology and Industrials make up almost 60 % of all companies on NASDAQ OMX Stockholm together while Oil & Gas counts for only 2,49 %.

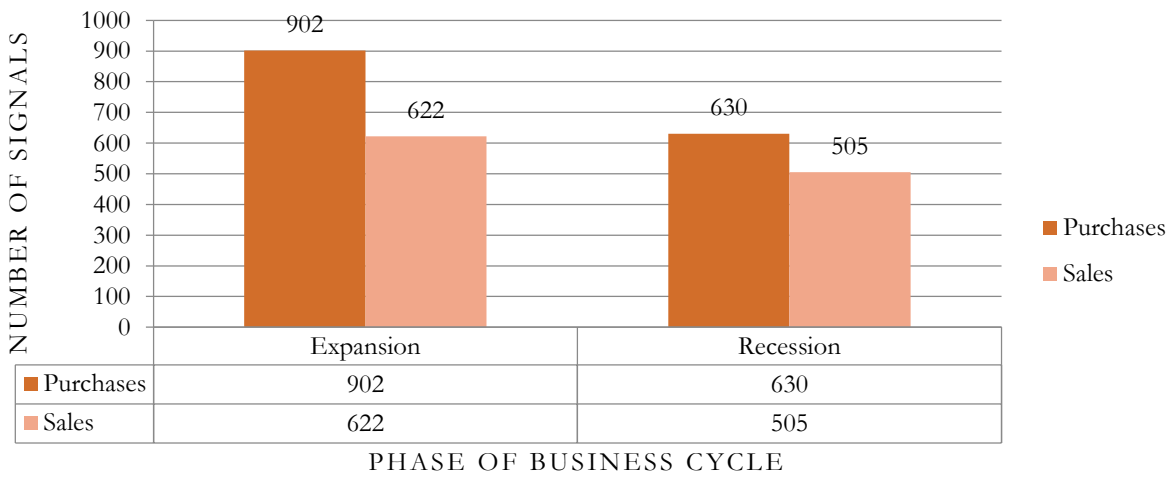
FIGURE 6.4
SUBSAMPLE 2: ICB INDUSTRY CLASSIFICATION



SOURCE: EK & ERLINDER (2015)

The signals obtained for the third subsample are shown in figure 6.5. As can be seen, clusters formed during years of expansion dominate in numbers over clusters formed from recession years.

FIGURE 6.5
SUBSAMPLE 3: STAGE OF BUSINESS CYCLE



SOURCE: EK & ERLINDER (2015)

6.2 Inferential Statistics

The following part of the study will cover the results obtained by testing the sample for significant cumulative abnormal return. All results will be presented in tables, where each row in the tables displays the result from a different event window. The layout will follow the same design, where the different event windows will be the following:

Second row: Event day +1 day.

Third row: Event day + 2 days

Fourth row: Event day + 5 days

Fifth row: Event day + 8 days

Sixth row: Event day + 10 days

The obvious point of interest is the cumulative average abnormal return (abbreviated CAAR) which varies for the different event windows. The results from the tests that has been performed on the sample will be shown in column 3 (Student's t-test), column 4 (Boehmer et. al.), column 5 (Corrado rank test) and column 6 (Shapiro-Wilk). All significant values are followed by asterisks (*) to improve the understanding of the results. The test for normality, Shapiro-Wilk, tests the distribution of the data under the null hypothesis that it follows the normal distribution. As a consequence, the results from the Shapiro-Wilk test will be the natural point of departure when presenting the results, as this test indicates whether a parametric or non-parametric test is more suitable. All tables will be followed by comments on what interpretations to make from the results. Naturally, the shaping of the results will follow the outline of the three different subsamples, as laid out in section 5.3. This study investigates both purchases and sales, and accordingly the results will be presented per each subsample. However, in order to facilitate for the reader, the results from all purchases will be presented at first, followed by the presentation of all sales. An analysis of each subsample will be presented at the end of each subsection. This pattern will repeat three times, once for each subsample. Before moving to the section with the results, it is worth to reiterate this study's hypothess:

H0 : Outsiders are not able to earn abnormal return by imitating cluster formation, formed from insider transactions.

H1 : Outsiders are able to earn abnormal return by imitating cluster formations, formed from insider transactions.

It is important to once again stress that the results below present outsiders' possibility to earn abnormal return. However, as was mentioned in section 5.9, transaction costs is a must to include to get an understanding of what it really costs to buy and sell shares. Transactions costs in practice consists of two parts, first one being the spread and second one being commission fees. The spread has been incorporated in the statistical tests since the stock prices that are used consist of mid-prices. Commission fees on the other hand vary depending on various factors and cannot be incorporated in a way that it captures the true cost in a fair way. Therefore, the CAARs presenting the possibilities of earning abnormal returns should be interpreted with the knowledge that commission fees will have an effect on the actual return, albeit it being quite low. To see the commission fees for a set of Swedish brokers, see table 5.3.

6.2.1 Subsample 1. Size of firm

The first subsample that has been tested and presented is the division made depending on firm size. The subsample is divided into six portfolios, were the results from each portfolio will be presented and explained. The six portfolios are classified according to the companies' respective size (market capitalization) and the study makes the same break downs as NASDAQ OMX Stockholm uses. The different portfolios that have been tested and the number of observed signals were further presented in section 5.3.1. These were:

- Large Cap-companies
- Mid Cap-companies
- Small Cap-companies

Once again, note that that sales and purchases are treated as different portfolios. The reason for splitting the sample up into two groups, sales and purchases, and looking at them individually is because the point of interest is the reaction from the events. If the study were to include sales and purchases in the same portfolio and treat them as equal transactions, the possibility of finding evidence of significant abnormal return would be subject to noise.

Subsample 1: Results from purchase portfolios

Large Cap

Table 6.1 below presents the results from the statistical tests performed on a portfolio consisting of all insider clusters found for purchases in Large Cap-companies.

Table 6.1 Purchases in Large Cap-companies

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event+1 day	0.0054	1.7181	2.3795	2.6782	0,002
2. Event+2 days	0.0055	2.2375	2.8290	3.0070	0,008
3. Event+5 days	0.0080	1.2007	1.7078	1.8215	0,083
4. Event+8 days	0.0095	1.0000	1.2134	2.4694	0,076
5. Event+10 days	0.0128	1.5131	1.6669	2.5185	0,092

* Significant at 5 % level ** Significant at 1% level

While this subsample consists of relatively many events, 414 to be exact, it cannot presumably be said to be of normal distribution. Hence, a normality test has been performed on the sample. The results from the Shapiro Wilk test, in the column to the right, indicate that for event windows 1 and 2, the distribution is not normal, whilst for event windows 3, 4 and 5 the Shapiro-Wilk test shows a normal distribution. The consequence of the differences in distribution will therefore be that a non-parametric test is more suitable for the two shortest event windows. The three longer event windows should be interpreted with a parametric test (Student's t-test and Boehmer et al). CAAR ranges from 0,54% to 1,28% and seem to be increasing, as the number of days increases. However, the null hypothesis cannot be rejected for any event window, meaning that outsiders are not able to earn abnormal return from following insiders' purchase cluster formations for Large Cap-companies. Also, interpreting the more robust parametric test (Boehmer et al.), leads to the same conclusion. No significance is found for any event window length.

Mid Cap

The portfolio of Mid Cap purchases consists of 524 cluster formations. Table 6.2 below presents the test results from a portfolio of cluster purchases for Mid Cap companies

Table 6.2 Purchases in Mid Cap-companies.

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event+1 day	0.0005	0.2323	0.5323	-0.0167	0,134
2. Event+2 days	0.0008	0.3429*	0.2359*	0.1177	0,122
3. Event+5 days	0.0037	1.3780*	0.6530**	1.0001	0,08
4. Event+8 days	0.0024	0.7796*	0.0372*	0.3533	0,071
5. Event+10 days	0.0021	0.5753*	0.4562**	0.0788	0,092

* Significant at 5 % level ** Significant at 1% level

By applying the same procedure as for the previous table and start by looking at the normality test, the values for the Shapiro-Wilk test suggest that the distribution is normal for all event windows. Therefore, the parametric tests should be used to interpret the CAAR. The CAAR is significantly positive for all event windows except the shortest event window ending 1 day after the event. This is confirmed by both Student's t-test and Boehmer et al. Regardless of which of the test that is used, the CAAR is significant at all other event window at the 5% significance

level. The Boehmer et al. test confirms that the CAAR for event windows 3 and 5 show significance at the 1% level, indicating very strong significance. Overall, the results show that outsiders are able to earn abnormal return for Mid Cap-companies for 4 out of 5 event window lengths.

Small Cap

Small cap companies provided 592 purchase cluster formations. Table 6.3 below presents the results.

Table 6.3 Purchases in Small Cap-companies

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event+1 day	0.0084	1.9154	2.0955	1.8172	0,078
2. Event+2 days	0.0140	2.7146*	2.7250*	2.4080*	0,067
3. Event+5 days	0.0175	2.6884**	3.0172**	2.3618*	0,113
4. Event+8 days	0.0140	1.9522**	2.0182**	0.6268	0,132
5. Event+10 days	0.0154	2.0603*	1.9397*	0.3132	0,141

* Significant at 5 % level ** Significant at 1% level

The CAARs for the all five event windows is positive and vary between 0,84% and 1,54%. The CAARs follow the same pattern as for Large Cap-companies and seem to increase as the number of days from the event increases. The Shapiro-Wilk-test indicates that the assumptions behind the normal distribution are met for all event windows, leading to the conclusion that the parametric tests are more suitable to use. Both Student's t-test and Boehmer et al.'s test indicate abnormal return for the four longest event windows. Only the shortest event window, ending 1 day after the event fails to provide outsiders the possibility of earning abnormal return, as the null hypothesis cannot be rejected for this event window. Bottom line is, outsiders are able to earn abnormal return in Small Cap-companies for all event windows except the shortest event window. 5 days after the event, outsiders achieve the largest cumulative abnormal return of 1,75% and 1,54%, 10 days after the event. An analysis of the results obtained from the portfolios consisting of purchases in subsample 1 will be presented at the end of this section. However, firstly results from the sales clusters will be given space.

Subsample 1: Results from sales portfolios

The following subsection will present the results from the second part of the first subsample, that is, the results from sales transactions generated from cluster transactions. The breakdown of the sample is the same as it was in the previous part. However, what is important to bear in mind when looking at the presented table below is that CAAR now is a result of sales and if CAAR is negative, the result should be interpreted as that a negative abnormal return has been detected which ultimately means that outsiders are able to earn this return if short-selling[6] the stock.

Large Cap

Table 6.1 below presents the results obtained from testing a portfolio of cluster formation based on insider sales in Large Cap-companies. The total number of signals for this portfolio was, as presented in section 6.1, 397 in total.

Table 6.4 Sales in Large Cap-companies

Event Window	CAAR	Student's t-test	Boehmer et. al.	Corrado Rank	Shapiro-Wilk
Event + 1 day	0.0019	0.9364	1.5857	0.8958	0,091
Event + 2 days	-0.0001	-0.0382	0.3930	-0.1651	0,112
Event + 5 days	-0.0012	-0.4334	0.2280	-0.1829	0,103
Event + 8 days	-0.0020	-0.5534	-0.3732	-0.3097	0,187
Event + 10 days	-0.0017	-0.4296	-0.2094	0.0371	0,136

* Significant at 5 % level ** Significant at 1% level

The CAARs from sales in Large Cap-companies vary between -0,2% to 0,19% but are not significantly lower than zero for any event window. Student's t-test and the Boehmer et al. test do not show any significance the 5% level. Although the Shapiro-Wilk test indicates that the sample is normally distributed, the conclusion would be the same irrespective of distribution as there is no sign of a possibility to earn abnormal returns from the non-parametric test either. The conclusion of this is that outsiders are not able to earn abnormal return by following sales clusters for Large Cap-companies.

[6] By short-selling a stock the investor makes money from declining stock prices.

Mid Cap

Moving over to the results from the portfolio consisting of sales clusters generated from transactions by insiders in Mid Cap-companies, the results are presented in table 6.5 below.

Table 6.5 Sales in Mid Cap-companies

Event Window	CAAR	Student's t-test	Boehmer et. al.	Corrado Rank	Shapiro-Wilk
1. Event + 1 day	-0.0044	-1.0109	-0.7333	-1.3085	0,048
2. Event + 2 days	-0.0072	-1.5281	-1.0851	-1.7358	0,045
3. Event + 5 days	-0.0232	-3.7894**	-3.5888**	-3.7981**	0,065
4. Event + 8 days	-0.0235	-3.3936**	-3.2707**	-3.2332**	0,054
5. Event + 10 days	-0.0289	-3.6722**	-3.5668**	-3.3694**	0,061

* Significant at 5 % level ** Significant at 1% level

The normality test indicates that CAAR should be interpreted with the parametric tests for the three longer event windows and the non-parametric rank test for the two shorter event windows. For Mid Cap-companies, the obtained results are very significantly smaller than 0 for the event windows ending five, eight and ten days after the event happened (the three longest). The chosen significance level is here 1 %. The conclusion that can be drawn from Student's t-test and the Boehmer et al. test is that for the three longer event window, very significant negative abnormal return is found. However, the value of the normality test is close 0,05 for all event windows (as can be seen in the column to the right). This means that albeit the above mentioned explanation of what test to use in the interpretation is correct, this is only valid at the 5 % level. Therefore, it is positive that if the Corrado Rank test was to be applied, the same conclusion would be drawn. Hence, the CAARs are significantly lower than 0 for the event windows ending five, eight and ten days after the clusters are formed. The same conclusion is not possible to determine for the two shorter event windows, were the CAARs do not significantly diverge from 0. Conclusively, outsiders earn abnormal return of up to 2,89% for sales clusters on Mid Cap-companies.

Small Cap

Table 6.6 below presents the findings from testing a portfolio of all cluster formation derived from sales in Small Cap-companies.

Table. 6.6 Sales in Small Cap-companies

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event+1 day	0.0118	2.3852*	2.0602*	2.2050*	0,012
2. Event+2 days	0.0091	1.8579	1.5326	1.5934	0,289
3. Event+5 days	-0.0021	-0.3405	-0.4763	-0.5327	0,043
4. Event+8 days	-0.0094	-1.3109	-1.5580	-1.1420	0,331
5. Event+10 days	-0.0166	-2.3414*	-2.3286*	-1.9908*	0,042

* Significant at 5 % level ** Significant at 1% level

As has been seen in the results from previous portfolios, the CAARs continuously grow in the same direction as time elapses from the event itself. The CAARs for the different event windows vary from 1,18% the day after the cluster has been formed to -1,66% for the event ending 10 days after the formation of the cluster. The Shapiro-Wilk test indicates that interpretations of the CAARs should be made with Corrado's Rank test for event windows 1, 3 and 5. Event windows 2 and 4 should be interpreted with the parametric tests. However, both the parametric and non-parametric tests show the same results. The CAAR for the event window ending 10 days after the event is statistically smaller than 0 meaning that the signal of three insider selling the stock in same company and thus forming a cluster is a powerful signal of a decline in the stock with 1,66% up to the 10th day that follows the release of the completion of the cluster.

Analysis Size of firm

Purchase clusters

After the having presented the CAARs from cluster formations based on firm size the immediate and most notable interpretation is that size of firm seems to have a significant impact. As the null hypothesis was rejected for a total of 8 out 10 event windows for Mid- and Small Cap-companies (except the shortest event window ending the day after the event), the logical conclusion is that outsiders are able to earn abnormal return by using purchase clusters as signals of when to buy the stock. Outsiders are thus able to make as much as 1,75 % of abnormal return by following insiders from Small Cap-companies. Connecting the results to the theories of information asymmetry, the insight in the firms seems to differ with size. According to theory, larger firms should suffer less from information asymmetry due to more transparency. This is confirmed by the results, since outsiders cannot use purchase clusters for Large Cap-companies to earn abnormal returns. Moreover, the results for purchase clusters for Large Cap-companies indicate that the market is quick to incorporate transaction news, which makes it more difficult for outsiders to imitate insiders.

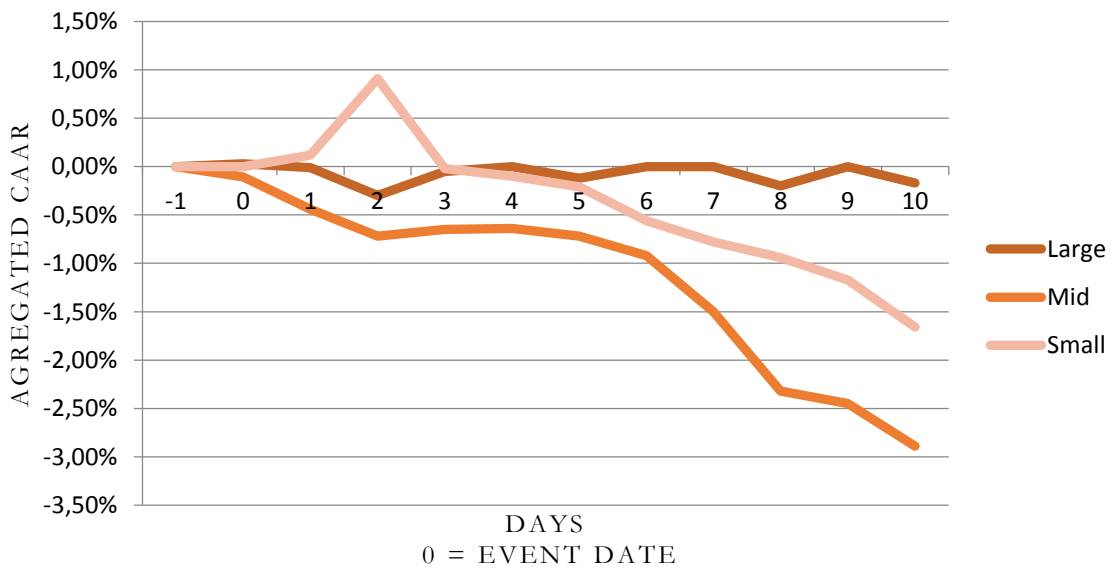
The results obtained from the tests are in line with some of the previously discussed studies. In line with Seyhun (1986), the results from purchase clusters in this study indicate that CAAR is significantly larger than 0 for Mid Cap- and Small Cap-companies. Regarding the hypothesis of outsiders being able to earn abnormal return, the results indicate that when conducting the test with mid-price (which incorporates one part of transaction costs) possibilities exist.
Jaffe (1974) made a distinction between different types of insiders but still found that insiders achieved abnormal return. Hence, Jaffe's results are strengthened by the results presented. Moreover, the result from the first subsample confirms the results obtained by Cheuk et al. and Wong et al. (discussed in chapter 5) who found proof of abnormal returns in smaller firms. Much like the results presented for this subsample, Cheuk et al and Wong et al. did not find any significant level of abnormal return in larger companies. However, one difference between the obtained results in this study and the results obtained by Cheuk et al. is the abnormal return from Mid Cap-companies. As presented in table 6.5, results show that there exist possibilities for outsiders to earn abnormal return for several event windows length for the Mid Cap-companies, which was not the case in study by Cheauk et al.

The results from the study conducted by Eckbo and Smith on Oslo Stock Exchange, who found a connection between insider transaction and negative CAAR, is not confirmed by the results from this study. As the model specifications differed, the results should not be compared. They performed their study on the Norwegian market and as this study focuses on the Swedish market, with a reservation that Eckbo and Smith used a time-weighted model and not the identical subsample, no distinctive similarity can be found between the two Scandinavian markets..

Sales clusters

Figure 6.6 below illustrates the interesting connection that, regardless of firm size, the sales transactions seem to be subject to a lagging effect, since the CAARS for Mid- and Small Cap-companies are showing an almost linear negative relationship relative to days passed since the event. The CAARs continuously grow into negative territory. The CAARs for Mid- and Small Cap-companies are undoubtedly negative for the longer event windows as the CAAR for the event windows ending 10 days after the event is -2,89% for Mid Cap-companies and -1,66% for Small Cap-companies. Connecting these finding with prevailing theories, the market seems to be slow with incorporating the information. That three insiders sell within five days of trading (thus forming a cluster) is obviously interpreted negatively and the abnormal return is significantly larger than 0 after this has happened. However, it takes time for the market to react to the information and not seldom is the major plunge in stock prices not seen until around 5 days

FIGURE 6.6
SALES CLUSTERS AND CAARS



after the actual event. Regarding the market efficiency hypothesis, prices do react to the information. However, the reaction takes time and the market do not meet the requirements of a strong market. The informativeness of sales clusters is stronger than for purchase clusters, since the CAARs are diverging more from 0. The Mid Cap-companies show the strongest significant abnormal return which indicates that this is where outsiders are able to earn the largest abnormal return. The practical interpretation of this is that short-selling the Mid Cap-stocks would lead to significant returns. It's definitely worth to mention that far from all stocks on NASDAQ OMX Stockholm are available for short-selling. Therefore, the opposite investment strategy could be applied, that is, if the investors owns a Mid Cap-stock where three insiders sell their company's stock and forming a cluster, the investor should sell the holdings in order to avoid abnormal losses. The fact that sales transactions show larger signs of abnormal return than purchases, is the contrary to Lakonishok and Lee's (2001) results. They found no connections between insider sales and lower stock prices. The authors' suggestion to the divergence in results might be due to this study's scope of testing cluster transactions instead of single insider sales event. Clusters show proof of being a more powerful signal.

6.2.2. Subsample 2: Industry classification

As the results from the first subsample were presented in the last section, focus will now shift to the second subsample of the study. In this subsample, the original sample has been divided into different portfolios depending on the companies' industry classifications. The full line of arguments for the second subsample was presented in section 5.5.2. The basis of the industry classification is the ICB standard, which most stock exchanges around the world has adapted to. The companies included in this study has been classified accordingly and the 9 different groups has been tested separately (note that the 10th group, Utilities, didn't provide any cluster formations and is hence ignored). In the same way as for subsample 1, the different groups are further separated into purchase clusters and sales clusters depending on the type of transaction. The results that are presented over the next pages include the following groups:

- Financials
- Telecom
- Basic Materials
- Consumer Services
- Industrials
- Technology
- Consumer Goods
- Oil & Gas
- Health Care

The approach regarding the lengths of the event windows is the same for this subsample as the previously presented one, that is, 5 different event windows has been tested for all portfolios. For a complete picture of the number of signals found for the different groups, the reader is advised to return to section 6.1 of this chapter were the signals were presented in detail.

Subsample 2: Results from purchase portfolios

Tables 6.7-6.9 below will present the results from the tests based on purchase clusters. In several industries, no abnormal returns are to be expected for an outsider as since the null hypothesis cannot be rejected on statistical grounds. Industries without possibilities for outsiders of earning abnormal return include: Industrials, Basic Materials, Technology, Consumer Service, Consumer Goods and Telecommunications. Neither the parametric tests nor the non-parametric test show any CAARs for which the null hypothesis can be rejected. The CAARs for purchase formations for these industries are therefore not significantly larger than 0. An interpretation of this is that outsiders are not able to earn abnormal return from the clusters generated for these firms. The results from the tests conducted on the purchase portfolios conducted on companies that did not provide significant CAARs can be seen in appendix 3. However three of the industries will be presented more in detail below.

Table 6.7 Purchases in Financial companies according to the ICB classification

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event + 1 days	0.0008	0.4096	0.9246	0.3258	0,183
2. Event + 2 days	0.0013	0.6461	1.2033	0.2326	0,164
3. Event + 5 days	0.0031	1.2795	1.7857	0.4658	0,224
4. Event + 8 days	0.0063	2.3250*	2.9610**	1.4904	0,124
5. Event + 10 days	0.0071	2.3230*	2.9548**	1.5737	0,198

* Significant at 5 % level ** Significant at 1% level

Table 6.7 above presents the results from financial companies. The Shapiro-Wilk test in the right column indicates that the sample follows the normal distribution and the parametric tests should be used in the interpretation. The CAARs for all event windows are positive and ranging from 0,08% to 0,71% depending on the event window length. The two parametric tests show test results that reinforce the interpretation of outsiders being able to earn abnormal return for the two longer event windows (event windows 4-5) as the null hypothesis can be rejected for these event windows. Both Student's t-test and Boehmer et al's test support this conclusion. Outsiders cannot earn abnormal return for the three shorter event windows (event windows 1-3).

Table 6.8 Purchases in Oil & Gas-companies according to the ICB classification

Event Window	CAAR	Student's t-test	Boehmer et. al.	Corrado Rank	Shapiro-Wilk
1. Event + 1 days	0.0273	1.8832*	2.1737*	1.2574	0,001
2. Event + 2 days	0.0425	2.9978**	3.2530**	2.0608*	0,000
3. Event + 5 days	0.0618	3.2314**	3.4428**	2.3253*	0,000
4. Event + 8 days	0.0630	2.2131*	2.5998**	1.7740*	0,001
5. Event + 10 days	0.0790	3.1407**	3.7476**	1.7572*	0,002

* Significant at 5 % level ** Significant at 1% level

The test for normality, Shapiro-Wilk, indicate that the sample do not follow a normal distribution. Therefore, Corrado's Rank test is better suited to use in the analysis of the CAARs. The CAARs are positive for all event windows and vary between 2,73% up to as much as 7,9%. Signals obtained from purchases in companies from the Oil & Gas industry show strong indications that a possibility to gain an abnormal return for outsiders exists. The Corrado Rank test show signs of strong significance for the event windows ending 2,5, 8 and 10 days after the event, hence meaning that outsiders might achieve abnormal return for all these event windows.

Table 6.9 Purchases in Health Care-companies according to the ICB classification

Event window	CAAR	Student's t-test	Boehmer et. al.	Corrado Rank	Shapiro-Wilk
1. Event + 1 days	0.0057	0.8103	1.2995	0.3281	0,107
2. Event + 2 days	0.0127	1.6121	1.7923	0.8790	0,122
3. Event + 5 days	0.0173	1.5679	1.7150	1.5657	0,045
4. Event + 8 days	0.0304	2.0640*	2.3134*	1.8518*	0,005
5. Event + 10 days	0.0360	2.3749*	2.2666*	2.0034*	0,002

* Significant at 5 % level ** Significant at 1% level

Table 6.9 above show the results from the tests conducted on companies classified as active within the Health Care industry. Shapiro-Wilk suggests that the sample is not normally distributed for the three longest event windows (event windows 3-5) and follow a normal distribution for the two shorter event windows (event window 1-2) . Student's t-test do not offer the opportunity to reject the null hypothesis for the event windows were the test is best suited. Neither does the more robust Boehmer et al. The values from the Corrado Rank test allow the null hypothesis to be rejected for the two longest event windows (event windows 4-5). The signals obtained from purchase clusters in Health Care therefore show statistically significant CAAR

larger than 0 for the event windows 8 and 10 days after the event, respectively. The interpretation of this is that outsiders are able to earn cumulative abnormal return of as much as 3,6% until the 10th day after the event in Health Care-companies

The analysis of purchase clusters from subsample 2 will be provided after the sales clusters have been presented.

Subsample 2: Results from sales portfolios

In the section below the results from the test conducted on portfolios consisting of sales clusters will be presented. The different portfolios consist of various amounts of observations and the complete list of signals that has been tested in this subsample is further presented in section 6.1.Much like the results from the purchase transactions exhibited above, several industries do not show significant CAARs diverging from zero. These industries include: Industrials, Consumer Services, Financials, Oil & Gas, Telecommunications and Health Care. The results from the tests conducted on these industries are presented in table in appendix 3. However, significant CAARs were detected in three industries and the results from the tests will be discussed and interpreted in table 6.10-6.12 below. Basic Materials, Technology and Consumer Goods are the industry groups with signs of a possibility to gain an abnormal return for outsiders.

Table 6.10 Sales in Basic Material companies according to the ICB classification

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro Wilk
1. Event + 1 day	-0.0112	-1.1152	-0.7464	-1.2419	0,022
2. Event + 2 days	-0.0099	-0.8672	-1.0224	-1.5311	0,223
3. Event + 5 days	-0.0172	-1.6031	-1.1627	-1.0150	0,046
4. Event + 8 days	-0.0257	-1.7602	-2.2102*	-1.1509	0,425
5. Event + 10 days	-0.0346	-2.0338*	-2.5085*	-1.2211	0,385

* Significant at 5 % level ** Significant at 1% level

Table 6.10 show that the sample is normally distributed for the event windows ending 2, 8 and 10 days after the event (event windows 2, 4 & 5). Therefore these event windows should be interpreted with the parametric tests. The remaining two event windows should be interpreted with the Corrado Rank test. The CAARs are negative across all event window lengths and vary between -1,12% and -3,46%. However, significance as measured by Student's t-test is only detected for the event ending 10 days after the event which means that outsiders are only able to achieve abnormal return for this event window length and not the others. However, looking at the Boehmer et al. test, an indication of a significant level can besides ten days after the event be spotted eight days after the event. The p-value eight days after the event for Student's t-test is fairly close to a significant level, a value of 0,0515, which indicates that the different result seen in the Boehmer et al. test is reasonable. To sum up, outsiders are able to earn abnormal return for event windows ending 8 and 10 days after the event with cumulative abnormal return of -2,57% and -3,46% respectively.

Table 6.11 Sales in Technology companies according to the ICB classification

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro Wilk
1. Event + 1 day	0.0026	0.4279	0.3607	-0.2210	0,001
2. Event + 2 days	0.0016	0.2711	0.3462	0.1062	0,021
3. Event + 5 days	-0.0095	-1.3292	-1.6299	-1.9975	0,000
4. Event + 8 days	-0.0156	-1.9470	-2.0946	-1.9966*	0,003
5. Event + 10 days	-0.0182	-2.1688*	-2.2694*	-1.9982*	0,003

* Significant at 5 % level ** Significant at 1% level

Table 6.11 exhibits the results from the sales portfolio of Technology stocks. The Shapiro-Wilk test indicates that all event windows should be interpreted with a non-parametric test as the assumptions behind the normal distribution are not met. The CAARs are showing negative return and vary between 0,26% and -1,82%. Corrado's Rank test shows that the event windows ending 8 and 10 days after the event are significant in the sense that outsiders are able to achieve abnormal return for these two event window lengths. For the remaining event windows (event windows 1-3) no significance is found and outsiders might thus not achieve abnormal return for those event windows.

Table 6.12 Sales in Consumer Goods companies according to the ICB classification

Event Window	CAAR	Student's t-test	Boehmer et. al.	Corrado Rank	Shapiro Wilk
1. Event + 1 day	-0.0025	-0.3909	-0.6906	-1.9888*	0,042
2. Event + 2 days	-0.0043	-0.6040	-0.8055	-1.6666	0,056
3. Event + 5 days	-0.0242	-2.2188*	-2.1086*	-2.5006*	0,032
4. Event + 8 days	-0.0296	-2.3085*	-2.2731*	-1.9918*	0,195
5. Event + 10 days	-0.0296	-2.0738*	-1.7649*	-1.6977	0,211

* Significant at 5 % level ** Significant at 1% level

Table 6.12 shows the results from the clusters formed from sales transactions made in companies classified as Consumer Goods. The normality tests indicates that the event windows ending 2, 8 and 10 days after the event should be interpreted with a parametric test and the event windows ending 1 and 5 days after the event should be analysed with a non-parametric test. For several event window length, CAARs are significant for the Consumer Goods companies. Looking at the event windows that should be interpreted with parametric tests, Student's t-test shows strong significant CAARs for the event windows ending 8 and 10 days after the event. The same conclusion is made looking at the Boehmer et al. test, while the event window ending 2 days after the event is not significant for any of the parametric tests. For the event window ending 1 day after the event, Corrado's Rank test shows that the negative CAAR of -0,25% for the first event window is significant at the 5% level. Also, the event window ending 5 days after the event show significant a CAAR of -2,42%. Hence, the conclusion of the results from Consumer Goods companies is that there exist an opportunity for outsiders to achieve abnormal return for event windows ending 1, 5, 8 and 10 days after the event with CAARs of -0,25%, -2,42%, -2,96% and -2,96% respectively.

Analysis Industry classification

A majority of the different industry classifications, in both buy and sell transactions, showed no signs of significance. However, a few of the groups indicated a possibility for outsiders to gain abnormal returns. The results might be related to the study of Chaeuk et al (2006). Chaeuk et al.'s results implied that abnormal returns were found but of different levels depending on the industry. However one of their conclusions were that insiders across all of the industries proved to be successful in their ability to gain abnormal returns. According to Chaeuk et al., the strongest signs of significant CAARs were found in the financial companies. The financial industry in this study indicated a significant p-value for purchase clusters but it was far from the industry classification with the strongest and most significant CAARs. The cumulative abnormal return for the Oil and Gas industry was larger, especially directly after the event. Looking at the results from the sales, there were no signs of significance at all for the financial portfolio. Chaeuk et al. found different levels of abnormal returns between the different industries, which is a similarity with this study. With that in mind it is important to remember that this study and the one by Chaeuk et al., were conducted on markets with differences with regards to size (Chaeuk et al. investigated the Hong Kong market) and legal aspects. Arguably, this could be one reason for the different results. Chaeuk et al.'s results also showed that sales lead to stronger signals than purchases. This result is not confirmed by the study's result, as several of the industries were not statistically significant and thus such a general conclusion cannot be made. One aspect of the result is that the null hypothesis is more often rejected for the longer event windows than the shorter which indicates that the variance in the sample is large right after the event. This leads to the interpretation of the market not seemingly aware of how to evaluate the outcome of the new information.

It could be argued that the strongest signs of outsiders' abnormal return were seen in one of the industries with the smallest sample to test from, raising the question of the smaller sample not giving the most trustable results. Therefore, it is questionable if the result regarding the Oil & Gas industry is truly reliable. On the contrary, the authors would like to state that the significant result regarding the Financial industry is reliable since it was the largest sample to test from: The same conclusion is made in the case of the Health Care industry that also indicated a possibility to earn abnormal returns in the purchases by using the cluster formation as a signal of

when to buy the stock. Overall, the industry classification shows mixed results in terms of outsiders not being able to achieve abnormal return by imitating insiders for most of the industries. This conclusion is valid for both sales- and purchase clusters.

6.2.3 Subsample 3: Phase of Business Cycle

The third subsample that this study seeks to investigate is a division of the original sample based on what phase of the business cycle the transactions were made. Broadly speaking, the economy could either be expanding or contracting. Insider's behaviour during different phases of the business cycle has been studied before (Lakonishok & Lee 2001 and Abumustafa & Nusair 2011). Insiders tend to perform differently depending on the overall conditions of the market. The main idea behind this classification is to classify years of being either (1) years of expansion, or (2) years of recession. As the companies in this study are of Swedish origin but have a large portion of their respective sales in foreign countries, an average of the GDP growth in Sweden, EU-15 countries and OECD countries has been used. The complete outline of how the sample division was made can be found in section 5.5.3. The signals for the cluster formations that has been used in this subsample and the distribution is presented in section 6.1. The portfolios that have been tested are the following:

- Cluster formations performed during years of **Expansion**
- Cluster formations performed during years of **Recession**

As for the previous subsamples both purchases and sales are included in the results but treated on individual bases.

Subsample 3: Results from purchases made during years of expansion

In table 6.13 below, the results from the tests conducted on a portfolio of purchase clusters during years of expansions are presented. The total number of signals in this subsample equals 902.

Table 6.13 Purchases during years of expansion

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event + 1 day	0.0019	1.2279	0.9166	0.3916	0,039
2. Event + 2 days	0.0037	2.0766*	1.4664	0.6906	0,042
3. Event + 5 days	0.0075	3.2460**	3.0351**	2.1782*	0,091
4. Event + 8 days	0.0067	2.4962*	2.4382*	1.2938	0,129
5. Event + 10 days	0.0067	2.3014*	2.1481*	1.1503	0,215

* Significant at 5 % level ** Significant at 1% level

The normality test has, as is customary, been performed to decrease the likelihood of misinterpretations. By looking at the values in column to the right, it can been concluded that the distribution can be assumed to be normal for the event windows ending 5, 8 and 10 days after the formation of the clusters. The two shorter event windows should be interpreted with the Corrado Rank Test. During the expansion years the results from the event study indicate positive CAARs for all event window lengths. Testing at a 5% significance level, the null hypothesis is rejected for 5, 8 and 10 days after the event. Both Student's t-test and the Boehmer et al. test render the same results. As the two shorter event windows should be interpreted with the non-parametric test, the null hypothesis is not rejected for either of the event windows. Consequently, outsiders are able to earn abnormal return by using purchase cluster from expansion as a signal of when to buy the stock. Outsiders would earn up to as much as 0,75% on average for the event window ending 5 days after the formation of the cluster.

Subsample 3: Results from purchases made during years of recession

Table 6.14 Purchases during years of recession

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event + 1 day	-0.0012	-0.4478	-0.8600	-0.1613	0,125
2. Event + 2 days	-0.0009	-0.2973	-0.5119	-0.0103	0,092
3. Event + 5 days	0.0031	0.8777	0.7615	0.8866	0,310
4. Event + 8 days	0.0019	0.5005	0.3538	0.2056	0,287
5. Event + 10 days	0.0013	0.3319	0.2676	0.0889	0,226

* Significant at 5 % level ** Significant at 1% level

No signs of significant CAARs can be read from table 6.14. With no signs of a significant p-values the null hypothesis cannot be rejected, which indicates that abnormal returns are not

possible to achieve. As a consequence, outsiders cannot earn abnormal return during years of recession, when using purchase clusters as a signalling tool.

Subsample 3: Results from sales made during years of expansion

Table 6.15 Sales made during years of expansion

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event + 1 day	0.0021	0.9347	0.7305	-0.3697	0,045
2. Event + 2 days	-0.0007	-0.3222	-0.3490	-1.3149	0,076
3. Event + 5 days	-0.0087	-3.1584**	-2.3760**	-3.0081**	0,132
4. Event + 8 days	-0.0115	-3.7011**	-2.9630**	-2.9233**	0,178
5. Event + 10 days	-0.0134	-3.9385**	-3.1653**	-2.7642**	0,092

* Significant at 5 % level ** Significant at 1% level

Similar to the results interpreted for the purchase clusters during years of expansion, strong indications of very significant CAARs can be seen. Looking at the Student's t-test as well as the Boehmer et al. test, the p-values are very significant (<0,01) for the event windows ending 5, 8 and 10 days after the completion of the cluster formation. The same conclusion is drawn from the Corrado Rank test, which further increase the validity of the results. The Shapiro-Wilk test is equivocal in terms of how the values for the different event windows hovers around 0,05. Values above 0,05 level indicate that the use of parametric tests is favourable to the use of a non-parametric test. Eventually, the use of correct model specifications increases the likelihood of true interpretations. In this case, all the results indicate the same, that is, outsiders being able to earn abnormal returns for the three longer event windows.

Subsample 3: Results from sales made during years of recession

Table 6.16 Sales made during year of recession

Event Window	CAAR	Student's t-test	Boehmer et al.	Corrado Rank	Shapiro-Wilk
1. Event + 1 day	0.0023	0.8589	0.7348	0.4902	0,001
2. Event + 2 days	-0.0022	-0.2269	-0.4667	-0.6753	0,021
3. Event + 5 days	-0.0105	-1.4073	-0.9215	-0.9406	0,006
4. Event + 8 days	-0.0079	-0.8727	-0.5524	-0.3662	0,056
5. Event + 10 days	-0.0163	-1.7404	-1.3250	-1.0836	0,065

* Significant at 5 % level ** Significant at 1% level

No signs of significant CAARs can be read from table 6.16. With no signs of significance, the null hypothesis cannot be rejected which indicate that no signs of abnormal returns can be achieved from sales made during years of recession.

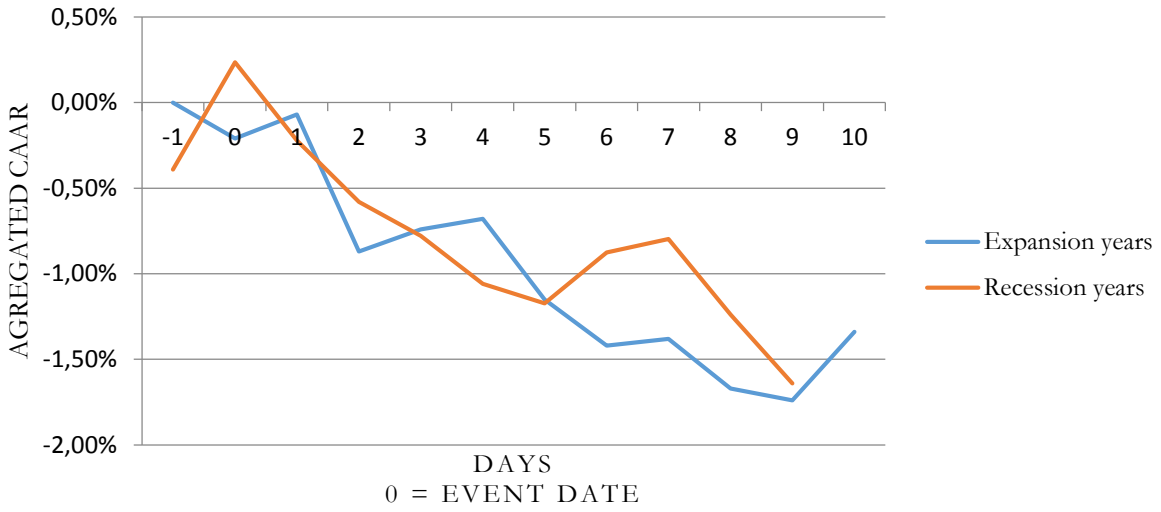
Analysis Phase of business cycle

A clear relationship was found testing the phases of a business cycle. Both for purchases and sales, the test values showed strong significance during years of expansion, meaning that outsiders are able to earn abnormal return during years when the economy is expanding. The cumulative abnormal return that outsiders were able to maximally achieve is topping at 0,75% for purchases -1,34 % for sales. Both values were significant. However, during years of recession, neither purchases nor sales were significant meaning that outsiders are not able to earn abnormal return during years of recession. The interpretation of the results points in a direction of a higher level of information asymmetry existing during the expansion years. The market is less effective in integrating the information of insiders' transactions. According to Fama's levels of efficiency, the market must be regarded as only fulfilling the requirements of the weakest form since outsiders are able to profit from the signals.

Looking at the comparison between purchase clusters and sales cluster, the conclusion becomes clear. Once again, sales is proving to be a stronger signal than purchases. Figure 6.7 on the next page show the CAAR for the sales portfolios during expansion years and recession years. As can be seen, the effect of three insiders selling their stocks proved to trigger a reaction of declining stock prices reaching around -1,50 %, starting from the day the of the release of the

transactions. Note that only for the years of expansion, the test results were statistically significant. Connecting the result to the findings by Abumustafa and Nusair, who established that insider sales were more informative during bad times than good times, the conclusion is not fully confirmed by this study's results. Comparing the clusters purchases to the clusters sales, the comparison quickly leads to the assumption of sales showing more significant divergences from 0. However, comparing the sales clusters from years of expansion to the dittos from years of recession, Abumustafa and Nusair's findings are not confirmed since insiders' transactions proves to be less informative during the recession years, that is, what Abumustafa and Nusair classified as bad times. A reason for this could be that this study investigates aggregated transaction while the study of Abumustafa and Nusair were looking at all insider transaction. Thus showing that cluster formations prove to signal a stronger informativness of sales than single insider sales events.

FIGURE 6.7
CAARS FOR SALES PORTFOLIOS
PHASES OF BUSINESS CYCLE



Also, as has been pointed at earlier, the interpretation of the results should be made with regards to transaction costs. The practical result of using the strategy of imitating insider cluster formations incurs a commission fees being paid for buying and selling the stock. Therefore, the actual results of adopting the strategy would be a couple of tenth a percent lower.

To conclude the phase of business cycle, the results from this study show that the market is not efficient during years of expansion, since outsiders are able to earn abnormal return from imitating insiders. For purchase clusters the cumulative abnormal return achieved is 0,75% for the event window ending 5 days after the formation of the cluster.

For sales, the same figure is -1,34%, achieved 10 days after the event. However, during recession years, the market is more effective in the sense that outsiders are not able to statistically profit from imitating insiders for neither sales nor purchases.

Chapter 7 Concluding Discussion

This chapter will present a concluding discussion of the results presented in the previous chapter. Thoughts connected to the results and the reasons for them will be stated. Finally, a proposition for further studies will be suggested.

7.1 Concluding discussion

The purpose of this study has been to investigate the possibility of imitating insiders' transactions on the Swedish stock market. A framework was set up to identify the possibly most strong signal of all, namely if three or more insiders conducted transactions during a period of five trading days. By scanning all transactions performed by insiders in companies on OMX NASDAQ Stockholm, 2 659 cluster formations were detected. These cluster formations formed the basis for the study. A division of the sample of clusters into subsamples based on firm size, industry classification and phase of business cycle was made. With a deductive approach of testing the hypothesis of outsiders' ability to earn abnormal return, statistical tests have been performed on the different subsamples. A normality test was included in order to make sure that misinterpretations of the results were avoided. Both parametric and non-parametric tests have been used when best suited. Different from most other studies, both purchase and sale transactions have been incorporated in the study. The purpose has been on investigating outsiders' ability to earn abnormal return, and not insiders'. The main reason for this is that several studies have already concluded that insiders earn abnormal return from their investments (Lakonishok and Lee 2001, Seyhun 1988), especially when testing clusters (Jeng et al. 1994). Therefore, not the transaction date but the release date of the insider transactions has been used throughout the study. The results showed that the Swedish stock market is far from effective in the sense that several opportunities exist for outsiders to earn abnormal return. Purchase clusters in Mid Cap-companies exhibited an impressive abnormal return of 2,89% for the event window ending 10 days after the cluster formation was completed. Also, the market seems slow at adapting to the information of insider clusters, which indicate that Fama's hypothesis of a strong market is not confirmed by the findings for the Swedish settings. More so, sales cluster showed an even larger impact than purchase clusters, with a cumulative average abnormal return of -2,89% on Mid Cap-companies and -1,66% for Small Cap-companies.

Therefore, it is not without a reason that the authors conclude that cluster formations constitute a very strong signal for outsider to earn abnormal return.

There is a saying that goes that insiders buy stocks for one and one reason only and that is to make money, while sales might to be due to a tons of reasons. However, the results from this study point in a different direction. The signal of three insiders selling the stock is, as has been concluded in this study, a very strong indicator of an approaching negative abnormal return.
An explanatory idea as why to the results being so explicit could be that insiders make transactions based on their own judgement of the true perceived value of the company. If a cluster formation has established, three or more insiders have made transaction in their company's stock within a week. Bearing in mind the prohibition on trading 30 days before the release of financial reports, which reduces the number of days that insiders are allowed to trade, there must be strong underlying reasons. Why, if not for making money, would three insiders sell their company's stock? With prevailing information asymmetry, especially in Mid- and Small-companies in Sweden, imitating insiders proves to be a prosperous strategy.
However, transactions costs should be taken into account when examining the results. This study has incorporated transaction costs in the testing model by using mid prices, that is, the average between bid- and ask quotes. True costs for buying and selling shares also include a commission fee paid by the investor to the broker. This cost occurs two times. Firstly when purchasing the shares and secondly when selling the shares. A list of commission fees for Swedish brokers was presented section 5.9.

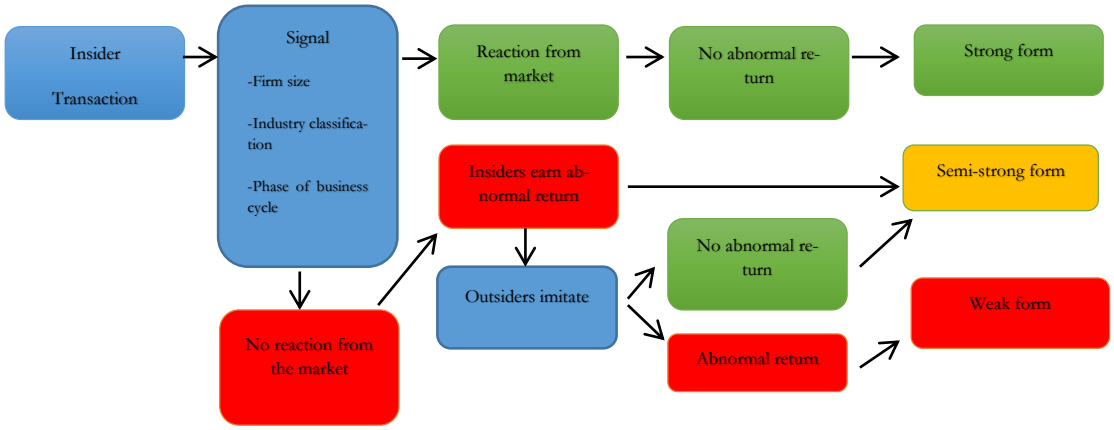
A limitation the authors chose was to not construct a multiple regression model and therefore not incorporate all subsamples in one test. Focus was instead on the variety in the individual samples. This study was applied on the Swedish stock market and the results obtained are only possible to generalize for Swedish settings. The main reason for us not being able to draw further generalizing conclusions is mainly due to the legislation surrounding insider trading. Each country has adopted its own set of rules and as long as the European Union do not follow up with previous proposition bills, a comparison of insider trading in different countries limps.

The efficient market hypothesis was discussed in chapter 2 and figure 7.1 illustrates how the different forms of an efficient market might be achieved. In this study, outsiders' ability to earn abnormal return has been proved for several subsamples, leading to the conclusion of a weak

form of market efficiency. Note, that for certain subsamples, no abnormal return was detected, thus leading to a strong form of market efficiency. It can be read from the figure that the form of efficient market not only depends on the possible achieved abnormal return but also on how insiders and outsiders act. The strongest form of market efficiency can be linked to the authors' conclusion of Large Cap-companies, several of the industry classifications and the recession stage of the business cycle. In these cases, the market reacts on new information immediately and a high level of transparency is substantiated. On the contrary, a weak market indicates a possibility to beat the market since it does not incorporate all of the relevant information. The conclusion can further be that in the event of a weak efficient market does the theory of a random walk not hold since the null hypothesis of no abnormal return can be rejected.

FIGURE 7.1

INSIDER TRANSACTIONS AND ABNORMAL RETURNS



SOURCE: OLOFSSON AND WAHLBERG (2011)

It has been shown that, given the above statement, it is valuable to imitate insiders forming cluster formations for Mid- and Small Cap companies and during years of expansion. It was also proved valid that abnormal returns were obtained when the subsample was divided into industry categories, based on the ICB classification. In spite of small test samples in some of the groups, Oil & Gas, Financials and Health Care showed significant cumulative abnormal return, leading to the conclusion that outsiders are able to earn abnormal return within these industries. The signalling theory is, just like the other discussed theories, of importance for this study. When transactions are made, information about the firm is communicated to the market. Hence, signals are released and perceived by outsiders. Judging by the overall results, the mar-

ket perceives sales as a stronger sign than purchases, leading to the conclusion that the informativness is larger for sales. With that in mind, insider would benefit from timing their sales carefully as the signal value is very strong.

7.2 Proposals for further research

The authors have in this study investigated a broad spectrum of different aspects concerning the possibility to hold abnormal returns. Naturally, there are still areas that could be of interest to do further research on.

- Since cluster formations have been proved to be a strong signal, a possible new research perspective would be to redefine the requirements of a cluster. A proposal for further research is to define cluster formations as a minimum of four or even five transactions conducted within a trading week. This could possibly lead to a stronger signalling effect than the already strong definition that this study has used.

- This study has investigated several subsamples to test for abnormal returns, both in purchase and sale transactions. Instead of, like in this one, only conducting single regressions for each sub-sample, it would be of interest to perform a multiple regression for all of the purchase transactions and a multiple regression for all of the sell transactions. The multiple regressions would extend and bring together an already thorough study and improve the predictability of the abnormal returns.

- The focus in this study has solely been on the Swedish stock market. An opening for a future study is to broaden the perspective and to shift focus towards international stock markets. The angle becomes interesting as there are large difference in laws and regulations for insider trading in different countries.

- This study has concluded that it is possible for outsiders to achieve abnormal returns in especially Mid- & Small Cap-companies. Therefore, it would be of interest for further research to study the relationship between insider trading and dividends. The study could possibly work with the signalling theory and expand Del Brio & Miguel's (2010) theory of a positive relationship between dividends and insider trading and the effect of combining different signals.

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Appendices

Appendix 1 The collaboration with Redeye

The study that you've just read has been written as a master project by two students from the School of Economics and Management in Lund. While the journey of writing this study has finally come to an end, the road of exploiting the information insiders' transactions still lies out there. The conceptual foundation behind the mispricing of instruments and picking up signalling tools to quantify the effects has always intrigued investors across the globe. All from value investors such as Berkshire Hathaway's Warren Buffet to prop traders in Switzerland have one thing in common; they use money to make money. Many have looked for the Holy Grail, but few if any have found it. When searching the field for interesting subjects, the authors took contact with the Swedish financial advisory firm, Redeye. The authors joined forces with Björn Fahlén, head of research, and Alex Sattelmaier, analyst, to kick a few ideas around topics that would suitable for spending one semester exploring and interesting enough to yield results that might lead to implications outside of the fortress of academics that university sometimes is. During a meeting that took place at Redeye's head office on Mäster Samuelsgatan in Stockholm, the idea of insider trading and outsiders' possible ability to earn returns from imitating the insiders own transactions quickly came up for grab. Both parts were intrigued by the subject and the authors were given a free hand to choose a line of approach that seemed reasonable enough to fulfil the academic requirements. Björn and Alex were supportive in the sense that they encouraged the authors to invest the time in a subject that would give valuable insight into something that academics all across the globe spend time researching. It is worth to mention that no compensation has been received whatsoever and the collaboration has been based on a shared fascination for financial markets. Redeye have been kind enough to provide valuable information regarding insider transactions, something that has facilitated the work process tremendously. All transactions undertaken by insider are publicly available but FI's insider registers do not meet the standard of an up-to-date database of 2015. Note that this opinion are solely the authors'. Hence, the collaboration between the authors and Redeye has been the opposite of reluctant and has in no way influenced the work process nor the results.

Appendix 2 Companies included in the study

Companies included from OMX Stockholm Large Cap

AARHUS-KARLSHAMN
ABB LTD N (OME)
AFRICA OIL (OME)
ALFA LAVAL
ASSA ABLOY 'B'
ASTRAZENECA (OME)
ATLAS COPCO 'A'
ATLAS COPCO 'B'
ATRIUM LJUNG-BERG 'B'
AUTOLIV SDB
AXFOOD
AXIS
BETSSON 'B'
BILLERUD KORSNAS
BOLIDEN
CASTELLUM
COM HEM HOLD-INGS
ELECTROLUX 'A'
ELECTROLUX 'B'
ELEKTA 'B'
ENQUEST (OME)
ERICSSON 'A'
ERICSSON 'B'
FABEGE
FASTIGHETS BALDER 'B'
GETINGE
HENNES & MAU-RITZ 'B'
HEXAGON 'B'
HEXPOL 'B'
HOLMEN 'A'
HOLMEN 'B'
HUFVUDSTADEN 'A'

HUFVUDSTADEN 'C'
HUSQVARNA 'A'
HUSQVARNA 'B'
ICA GRUPPEN
INDUSTRIVAR-DEN 'A'
INDUSTRIVAR-DEN 'C'
INDUTRADE
INTRUM JUSTITIA
INVESTOR 'A'
INVESTOR 'B'
JM
KINNEVIK 'A'
KINNEVIK 'B'
LATOUR INVEST-MENT 'B'
LIFCO B
LOOMIS 'B'
LUNDBERG-FORETAGEN 'B'
LUNDIN MINING SDB
LUNDIN PETRO-LEUM
MEDA 'A'
MELKER SCHORLING
MILLICOM INTL.CELU.SDR
MODERN TIMES GP.
MODERN TIMES GP.MTG 'B'
MTG 'A'
NCC 'A'
NCC 'B'
NIBE INDUSTRIER 'B'

NOBIA
NORDEA BANK
ORIFLAME COS-METICS SDR
PEAB 'B'
RATOS 'A'
RATOS 'B'
SAAB 'B'
SANDVIK
SCA 'A'
SCA 'B'
SEB 'A'
SEB 'C'
SECURITAS 'B'
SKANSKA 'B'
SKF 'A'
SKF 'B'
SSAB 'A'
SSAB 'B'
STORA ENSO 'A'
STORA ENSO 'R'
SWEDBANK 'A'
SWEDISH MATCH
SWEDISH OR-PHAN BIOVITRUM
SVENSKA HAND-BKN.'A'
SVENSKA HAND-BKN.'B'
TELE2 'A'
TELE2 'B'
TELIASONERA
TIETO CORPORA-TION (OME)
TRELLEBORG 'B'
WALLENSTAM 'B'
VOLVO 'A'
VOLVO 'B'

Companies included from OMX Stockholm Mid Cap

ACTIVE BIOTECH
ADDTECH 'B'
ÅF 'B'
ARCAM 'B'
AVANZA BANK HOLDING
B&B TOOLS 'B'
BACTIGUARD HOLD
BEIJER ALMA 'B'
BEIJER REF AB
BILIA 'A'
BIOGAIA 'B'
BLACKPEARL RESOURCES SDR
BUFAB
BURE EQUITY
BYGGMAX GROUP
CATENA
CAVOTEC
CLAS OHLSON 'B'
CLOETTA 'B'
CONCENTRIC
COREM PROPERTY GROUP
DIOS FASTIGHETER
DUNI
EAST CAPITAL EXPLORER
ENIRO
FAGERHULT
FAST PARTNER
FENIX OUTDOOR INTL
FINGERPRINT CARDS 'B'
GRANGES
GUNNEBO
HALDEX

HEBA 'B'
HEMFOSA FASTIGHETER
HIQ INTERNATIONAL
HMS NETWORKS
INDL.& FINL.SYS.'B'
INDL.& FINL.SYS.'A'
INWIDO
ITAB SHOP CONCEPT 'B'
KAPPAHL
KLOVERN B
KLOVERN A
KUNGSLEDEN
LAGERCRANTZ GROUP 'B'
LINDAB INTERNATIONAL
LUCARA DIAMOND
LUNDIN GOLD (OME)
MEDIVIR 'B'
MEKONOMEN
MUNKSJO (OME)
MYCRONIC
NEDERMAN HOLDING
NET ENTERTAINMENT
NE 'B'
NEW WAVE GROUP 'B'
NGEX RESOURCES
NOLATO 'B'
NORDNET 'B'
NP3 FASTIGHETER
OASMIA PHARMACEUTICAL

OEM INTERNATIONAL 'B'
OPUS GROUP
ORESUND INVESTMENT
OREXO
PLATZER FASTIGHETER
PROFFICE 'B'
QLIRO GROUP
RECIPHARM AB
REZIDOR HOTEL GROUP
SAGAX
SAGAX 'B'
SAS
SCANDI STANDARD
SECTRA 'B'
SEMAFO (OME)
SKISTAR 'B'
SWECO 'A'
SWECO 'B'
SWEDOL 'B'
SYSTEMAIR
TETHYS OIL
THULE GROUP
TRANSCOM WW
TRANSMODE
TRIBONA
UNIBET GROUP SDB
VBG GROUP
VICTORIA PARK
VICTORIA PARK B
VITROLIFE
VOSTOK NAFTA INV.SDR
WIHLBORGS FASTIGHETER

Companies included from OMX Stockholm Small Cap

ACANDO 'B'
ADDNODE 'B'
AEROCRINE 'B'
ALLENEX
ALLTELE
ALLM.SVEN.TELAB
ANOTO GROUP
ARCTIC PAPER (OME)
ARISE
AVEGA GROUP 'B'
BE GROUP
BEIJER ELECTRONICS
BERGS TIMBER 'B'
BESQAB PROJEKT & FASTIGH
BIOINVENT INTL.
BIOTAGE
BJORN BORG
BLACK EARTH FARMING SDB
BONG
BOULE DIAGNOSTICS (WI)
BTS GROUP
BULTEN
CELLAVISION
CONCORDIA MARITIME 'B'
CONSILIUM 'B'
C-RAD 'B'
CTT SYSTEMS
CYBERCOM GROUP EUROPE
DEDICARE
DGC ONE
DORO
DUROC 'B'
ELANDERS 'B'
ELECTRA GRUPPEN
ELOS 'B'
ENDOMINES
ENEA
EOLUS VIND B
EPISURF MEDICAL

ETRION (OME)
EWORK SCANDINAVIA
FEELGOOD SVENSKA
FORMPIPE SOFTWARE
G5 ENTERTAINMENT
GEVEKO 'B'
GLOBAL HEALTH PARTNERS
HEMTEX
I A R SYSTEMS GROUP
IMAGE SYSTEMS
INTELLECTA 'B'
KABE HUSVAGNAR 'B'
KARO BIO
KAROLINSKA DEVELOPMENT (WI)
KNOW IT
LAMMHULTS DESIGN GROUP
MALMBERGS ELEKTRISKA 'B'
MICRO SYSTEMATION 'B'
MIDSONA 'A'
MIDSONA 'B'
MIDWAY HOLDINGS 'A'
MIDWAY HOLDINGS 'B'
MOBERG PHARMA
MQ HOLDING
MSC KONSULT 'B'
MULTIQ INTERNATIONAL
NET INSIGHT 'B'
NEUROVIVE PHARMACEUTICAL
NORDIC MINES
NORDIC SER.PTNS.HDG.'B'
NOTE

NOVESTRA
NOVOTEK 'B'
ODD MOLLY INTL.
OPCON
ORTIVUS 'A'
ORTIVUS 'B'
OSCAR PROPERTIES
PA RESOURCES 'B'
PARTNERTECH
POOLIA 'B'
PRECISE BIOMETRICS
PREVAS 'B'
PRICER 'B'
PROACT IT GROUP
PROBI
PROFILGRUPPEN 'B'
RAYSEARCH LABS.'B'
REDERI AB TNSAT.'B'
REJLERS B
RNB RETAIL AND BRANDS
ROTTNEROS
SEAMLESS DISTRIBUTION
SEMCON
SENSYS TRAFFIC
SHELTON PETROLEUM
SINTERCAST
SOFTRONIC 'B'
STOCKWIK FORVALTNING
STUDSVIK
SVEDBERGS I DALSTORP 'B'
TRACTION 'B'
TRADEDOUBLER
TRIGON AGRI
UNIFLEX 'B'
VENUE RETAIL GROUP 'B'
VITEC SOFTWARE GROUP 'B'
XANO INDUSTRI 'B'

Delisted included companies OMX Stockholm All caps

ACADEMEDIA
ACAP
AFFÄRS-STRATEGERNA AB
ALLIANCE OIL
ASPIRO
AUDIODEV AB
AVAILO
BIOLIN SCIENTIFIC
BORÅS WÄFVERI AB
BOSS MEDIA
BRINOVA
BROSTRÖM
CARDO
CARL LAMM AB
CARNEGIE & CO AB
CASHGUARD AB
CONNECTA
DAGON
DIN BOSTAD
DIREKT AB
ELEKTRONIKGRUP-PEN
FAZER KONFEKTYR
GANT
GUNNEBO INDUS-TRIER
HL DISPLAY
HÖGANÄS
HOME PROPERTIES
HQ AB
HUMAN CARE HC AB
KMT GROUP
LBI INTERNA-TIONAL
LEDSTIERNAN
MODUL 1 DATA
MUNTERS AB
NEONET XPONCARD GROUP AB
NETONNET
NEXUS TECHNOL-OGY AB
NILÖRNGRUPPEN
NOBEL BIOCARE

NOVACAST TECH-NOLOGIES AB
ORC GROUP
OXIGENE INC
Q-MED
READSOFT
RÖRVIK TIMBER
SCANIA AB
SECURITAS
SKANDITEK INDUS-TRIFÖRVALTNING AB
SVITHOID TANKERS AB
SWITCHCORE AB
TELELOGIC
TELIGENT AB
TICKET TRAVEL GROUP
TILGIN
TRICORONA
ZODIAK TELEVI-SION AB

Appendix 3

Results from subsample 2: purchase clusters

Industrials			
Date	CAAR	Student's t-test	Corrado Rank
Event + 1 days	0.0018	0.6446	0.1453
Event + 2 days	0.0026	0.8168	0.1230
Event + 5 days	0.0005	0.1366	1.1487
Event + 8 days	0.0014	0.3394	0.7492
Event + 10 days	0.0035	0.8667	0.2829

Basic Materials			
Date	CAAR	Student's t-test	Corrado Rank
Event + 1 days	0.0088	1.2815	1.4128
Event + 2 days	0.0090	0.9695	0.7298
Event + 5 days	0.0171	1.2242	1.5385
Event + 8 days	0.0077	0.5427	0.4210
Event + 10 days	0.0046	0.3043	0.0582

Technology			
Date	CAAR	Student's t-test	Corrado Rank
Event + 1 days	0.0067	1.0608	0.6268
Event + 2 days	0.0097	1.0556	0.4148
Event + 5 days	0.0152	1.4160	0.9604
Event + 8 days	0.0121	1.0948	0.3234
Event + 10 days	0.0163	1.4310	0.9584

Date	CAAR	Student's t-test	Corrado Rank
Consumer Service			
Event + 1 days	0.0013	0.2370	0.2232
Event + 2 days	0.0017	0.2909	0.2668
Event + 5 days	0.0096	1.2672	1.0329
Event + 8 days	0.0067	0.8574	0.2314
Event + 10 days	0.0018	0.1988	0.4444

Date	CAAR	Student's t-test	Corrado Rank
Consumer Goods			
Event + 1 days	0.0026	0.5503	0.9245
Event + 2 days	0.0006	0.1133	0.4714
Event + 5 days	0.0034	0.5378	0.2227
Event + 8 days	0.0042	0.5514	1.0047
Event + 10 days	0.0013	0.1627	0.6435

Date	CAAR	Student's t-test	Corrado Rank
Telecommunications			
Event + 1 days	0.0137	1.6442	1.8391
Event + 2 days	0.0080	0.8672	0.5015
Event + 5 days	0.0053	0.5589	0.3330
Event + 8 days	0.0058	0.5833	0.5258
Event + 10 days	0.0040	0.4187	0.4063

Results from subsample 2: sales clusters

Event Window	CAAR	T-test	Boehmer et. Al.	Corrado Rank
Industrials				
Event + 1 day	0.0023	0.8521	1.7031	1.1857
Event + 2 days	-0.0017	-0.5622	0.4787	-0.3239
Event + 5 days	0.0002	0.0470	1.4341	0.7365
Event + 8 days	-0.0015	-0.3241	1.0925	0.6579
Event + 10 days	-0.0029	-0.5961	0.7642	0.3288

Event Window	CAAR	T-test	Boehmer et. Al.	Corrado Rank
Consumer Services				
Event + 1 day	0.0016	0.3275	0.7659	0.7607
Event + 2 days	0.0003	0.0604	0.3143	0.4502
Event + 5 days	-0.0102	-1.3993	-1.1807	-0.6986
Event + 8 days	-0.0024	-0.2840	-0.5713	0.1685
Event + 10 days	-0.0126	-1.2782	-1.3374	-0.5019

Event Window	CAAR	T-test	Boehmer et. Al.	Corrado Rank
Financials				
Event + 1 day	0.0016	0.3275	0.7659	0.7607
Event + 2 days	0.0003	0.0604	0.3143	0.4502
Event + 5 days	-0.0102	-1.3993	-1.1807	-0.6986
Event + 8 days	-0.0024	-0.2840	-0.5713	0.1685
Event + 10 days	-0.0126	-1.2782	-1.3374	-0.5019

Event Window	CAAR	T-test	Boehmer et. Al.	Corrado Rank
Oil & Gas				
Event + 1 day	0.0102	1.7830	0.7590	0.2605
Event + 2 days	0.0084	1.5642	0.4411	0.2444
Event + 5 days	0.0072	1.2911	-0.0965	-0.4174
Event + 8 days	0.0025	0.4578	-1.1368	-1.5916
Event + 10 days	-0.0016	-0.3031	-1.3945	-1.6115

Event Window	CAAR	T-test	Boehmer et. Al.	Corrado Rank
Telecommunications				
Event + 1 day	0.0071	1.6997	1.5043	1.2890
Event + 2 days	0.0080	1.1036	0.6048	1.0400
Event + 5 days	0.0104	1.0883	0.6232	0.7645
Event + 8 days	-0.0017	-0.1661	-0.4475	0.5084
Event + 10 days	0.0019	0.1439	-0.1456	0.6514

Event Window	CAAR	T-test	Boehmer et. Al.	Corrado Rank
Health Care				
Event + 1 day	0.0058	0.6383	0.1131	0.0369
Event + 2 days	-0.0007	-0.0852	-0.5036	-0.6158
Event + 5 days	-0.0164	-1.4955	-1.5134	-1.5674
Event + 8 days	-0.0117	-0.7140	-0.6537	-1.0672
Event + 10 days	-0.0176	-1.0710	-1.0412	-1.3058

Kluster, genvägen till utökat studiebidrag?

Lundastudenterna Philip Ek och Karin Erlinder har tagit sig an den svenska aktiemarknaden. Genom att identifiera kluster av köp- och säljtransaktioner har de testat om onormal avkastning kan uppnås efter imitation av insiders.

Insider trading är ett allsidigt ämne med både en legal och en illegal del. Studenterna Philip Ek och Karin Erlinder valde att i sin magisteruppsats på Civilekonomprogrammet i Lund studera den legala delen av insider trading, applicerat på den svenska marknaden. Insider trading utgör ett väl beforskat område vilket gjorde vikten av att skapa nytänkande hypoteser tyngre. Skribenterna valde att fokusera på den svenska marknaden vilket gjorde att det inte till fullo var att förvänta likadana resultat som tidigare erkända studier, däribland Seyhun, hade uppnått. Vid intervju med herr Ek och fröken Erlinder förklarar de att de alltid har varit intresserade av om det är möjligt att ”slå marknaden” och att det var detta som ledde in på insider trading och teorierna kopplade till ämnet. För att sticka ut från tidigare uppsatser publicerade i Sverige valde de att, likt forskaren Seyhun, att arbeta med kluster och att dela upp testurvalet i ett flertal grupper.

Fokus i studien

Samtliga köp- och säljtransaktioner, gjorda på den svenska marknaden, mellan åren 2005-2014, i stora, medelstora och små företag har behandlats, detta för att ge ett djup i analysen. Det innebär att allt från de stora företagen såsom Alfa Laval och Volvo till de mindre likt Hemtex, har behandlats. Vidare berättar Ek och Erlinder att de vid genomgång av samtliga transaktioner identifierade kluster som definierades som händelser då tre eller fler gjorda insider transaktioner skedde. Vid intervjun med forskarna vill de poängtera den stora mängden data som har behandlats, i förhoppningen om att få ett så precist resultat som möjligt. Det ursprungliga urvalet bestod av 125 657 transaktioner som sedan filtrerades tills det kvarstod 50 124 aktietransaktioner. Ur dessa transaktioner identifierades sedan 2 659 kluster.

Vidare valde författarna att skapa tre olika delprover som eventstudier (metod för att mäta inverkan av händelser, red anm) skulle genomföras på. De utvalda fördjupningarna blev företagsstorlek, industritillhörighet och fas av konjunkturcykeln.

Företagsstorlek

Möjligheten att uppnå överavkastningar i olika företagsstorlekar har varit fastställt i ett flertal länder och nu även i Sverige. Författarna hänvisar bland annat till Piotroski och Roulstone som har påvisat att det finns möjligheter att imitera insiders för att uppnå onormala avkastningar, med en fördel mot de mindre företagen. Ek och Erlinder finner likvärdiga resultat i sin studie på den svenska marknaden, dock utan att utesluta att samma effekt kan återfinnas i medelstora företag då det även fanns en tydlig signifikant överavkastning i dessa. Då Ek och Erlinder

valde att titta på både köp- och säljtransaktioner gjordes även en uppdelning mellan dessa i samband med testandet. Säljtransaktioner visade ett större signalvärde än köptransaktioner, vilket nu har skapat ett ramaskri i forskningsvärlden. ”Ett slag under bältet”, som adjunkt Rolfsson från företagsekonomiska institutionen vid Lunds Universitet, kommenterade resultat. ”Att jag själv inte tänkt i dessa banor gör mig uppriktigt förbannad. Nåväl, jag hoppas innerligt att Ek och Erlinder blir rikligt belönade i december när årets Nobelpristagare i ekonomi ska tillkännages”, fortsätter Rolfsson.

Industritillhörighet

De valda industrierna finns bestämda av Industry Classification Benchmark (ICB) och presenteras som nio olika; Financials, Technology, Basic Materials, Consumer Service, Consumer Goods, Oil and gas, Industrials, Utilities, Health Care och Telcom. I sin analys gör författarna en reservation för att antalet testade företag i de olika industrierna skiljer sig åt vilket även kan återspegla resultatet. Sett till studien kan Ek och Erlinder påvisa signifikanta onormala avkastningar i ett fåtal av industrierna på den svenska marknaden, både gällande köp- och säljtransaktioner. Dock hittades inget samband mellan de signifikanta industrierna i köptransaktionerna jämfört med de signifikanta industrierna i säljtransaktionerna då de enligt resultatet var olika. Störst chans till att lyckas imitera insiders och därmed uppnå onormal avkastning återfanns i oil och gas industrin. Författarna berättar vidare att det var en av industrierna med endast ett fåtal företag i och att industrin financials, som även den påvisade en möjlighet att imitera insiders för att få erhålla överavkastningar, istället var mer relevant att analysera då företagen var fler och därför kan ha gett ett mer exakt svar. Trots detta föringar Ek och Erlinder inga resultat utan tar alla i beaktning.

Fas av konjunkturcykeln

Studenterna förklarar vidare att de två ovan nämnda deltesterna är vanligt förekommande i studier om insider trading. De valde på grund utav det även ett tredje deltest, vilket blev att studera de två faserna i konjunkturcykeln; expansionen och recessionen. Till lite förvåning fann de väldigt tydliga resultat som visade att den största chansen för en utomstående att imitera en insider och därmed tjäna på detta var i expansionsfasen, både i köp- och säljtransaktioner.

Efter en uppsats

Ek och Erlinder hoppas att de har bidragit med ett djup till tidigare studier på den svenska marknaden och framförallt en variation då majoriteten enbart har undersökt köptransaktioner. Enligt författarna finns lika intressanta analyser att göra i säljtransaktioner och innan intervjun avslutades flikade de in att ju längre tiden går med en uppsats desto mer har de lärt att vinklarna för nya undersökningar är enorma. De själva önskar att någon inriktar sig på en multipel regression för att kunna knyta ihop de olika delproverna till ett test. Väl rutet säger vi på reaktionen.