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Post Earnings Announcement Drift in Swedish Small Cap Listed Firms

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Abstract

Previous research has found abnormalities after quarterly earnings announcements, which question the efficiency of the capital market. The main purpose of this paper is to investigate abnormalities in the Swedish stock market, applied on small cap listed firms on NASDAQ OMX Nordic Stockholm. The main models are Standardized Unexpected Earnings (SUE) and Cumulated Abnormal Return (CAR), which are based on Setterberg (2011) and Börjesson and Johansson (2012). The empirical result of this paper finds a positive effect in the abnormal return after two and four quarters when positive unexpected earnings are presented. The opposite result is found for negative unexpected earnings, which lead to a negative development in the abnormal return. Parts of the time period investigated is, however, not able to reveal the classic Post Earnings Announcement Drift (PEAD). This paper concludes that the capital market is not always efficient since abnormalities are found among the investigated small cap listed firms.

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1. Introduction

1.1 Background

There is a large body of research, examining financial statement information in relation to the capital market. Part of the explanation to the demand in research is connected to market efficiency (Ryan et al., 2002). According to Fama (1970) the most extreme form of market efficiency include all different types of information, even information that is not publicly available, whereas market prices in the weak form of the market efficiency reflect old information. Especially the semi-strong form of market efficiency has been analysed and developed over the years (Ryan et al., 2002). The semi-strong form implies that market prices reflect all the available information in the capital market (Fama, 1970).

Among the accounting information, accounting earnings are argued to be especially interesting since these are important for making investment decisions in the capital market (Luire & Shuv, 2010). Compared to other information presented in the financial statement, the accounting earnings is more important since they increase the wealth of the investor (Setterberg, 2011). Quarterly Earnings Per Share (EPS) are presented in financial statements but can also be calculated manually, by dividing the net profit of the firm with the numbers of shares outstanding (Berk & DeMarzo, 2011).

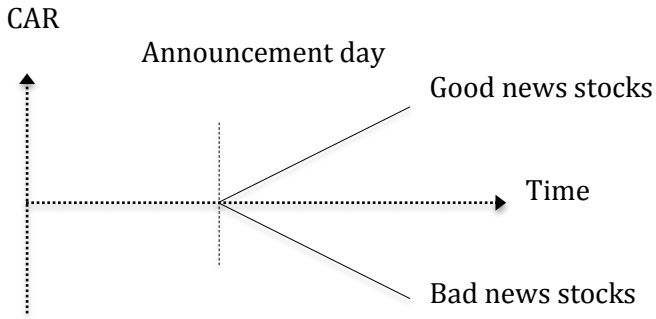
At the same time as the empirical findings of the predictability of accounting information started to spread, research also tend to question the fact that available information actually is reflected in market prices. One cluster of research is the Post Earnings Announcement Drift (PEAD) (Ryan et al., 2002). The PEAD research examines the relationship between the accounting earnings and market return, where the drift is measured as price fluctuations in the stock market after earnings announcements (Sadka, 2006). The post earnings announcement research is included in the research of the capital market, which tests the market efficiency in accounting information (Kothari, 2001).

1.2 Post Earnings Announcement Drift

Ball and Brown (1968) showed the first empirical evidence of PEAD in share prices in the US stock market. The authors presented the PEAD to cause a positive trend in the abnormal return of share prices after earnings announcements when the firm presented positive unexpected earnings. Positive unexpected earnings is when actual earnings are greater compared to the forecasted earnings. Ball and Brown further presented the PEAD to cause a negative trend in share prices when the firm presented negative unexpected earning. Presenting negative unexpected earnings implies that the actual earnings presented in the financial statement are lower compared to the forecasted earnings. The research concludes that the capital market

does not reflect all available financial information in the stocks, since a PEAD is distinguished after earnings announcements. More recent studies have in addition proved the existence of PEAD (Baakrishnan et al., 2010; Chung & Hrazdil, 2011; Setterberg, 2011; Barber et al., 2012; Johnson & Zhao, 2012). Figure 1.1 expresses the PEAD graphically, where the positive unexpected news after the announcement day is related with a higher Cumulated Abnormal Return (CAR). A lower CAR is expected after negative unexpected earnings.

Figure 1.1 Post Earnings Announcement Drift



(after Setterberg, 2011 p.7)

1.3 Explanations to why PEAD exists

The most common explanation to why PEAD occurs is that the capital market is inefficient. An inefficient market implies that the market is unable, or that it is hard to reveal the true economic value of assets, which creates mispricing in the market trading (Foster et al., 1984). The accounting information in the inefficient market is thus more an indicator of a firm's true value (Setterberg, 2011). Transaction costs and barriers to arbitrage are mentioned in the literature to cause such mispricing (Ng et al., 2008; Chordia et al., 2009; Chung & Hrazdil, 2011). Research also argue that the mispricing is due to different behavioural aspects of the investor, such as investor conservatism, self-confidence, or the specific type of investor who reach the earnings information (Hong & Stein, 1999; Daniel et al., 1998; Chen, 2012).

1.4 Small listed firms

The PEAD is pronounced in firms with low analyst following, low institutional attention (Livnat & Mendenhall, 2006) and firms that have high information uncertainty (Francis et al., 2007). Bhushan (1994) explicitly provide evidence that trading activities affect the drift. Firms that are less frequently traded tend to present a greater PEAD. Findings from the US stock market further confirms that growth firms, who do not meet the market expectations and therefore provide negative abnormal earnings, have a larger negative reaction in its share prices, in comparison with large firms (Skinner & Sloan, 2002; Johnson & Zhao, 2012).

The fact that small firms have less analyst following and institutional attention compared to large firms (Bhushan, 1994; Ng et al., 2008) strengthens the importance to analyse small firms. Ng et al., (2008) argues that samples which only includes small firms, are more powerful investigating PEAD, due to these firm's higher transaction costs and low institutional ownership. Assuming small firms to be less visible and provide investors with less exact information, in comparison with large ones, the drift would thus be greater for such firms (Foster et al., 1984). In fact, Foster et al., find that 85 percentage of the investigated PEAD to be credited from small listed firms. This finding of Foster et al., is similar to Bernard and Thomas (1989, 1990) and Hew et al., (1996) who also find the drift to be more noticeable in small listed firms.

1.5 Research question

The aim of this research is to investigate the market expectations of quarterly EPS for small listed firms, and to examine to what extent the share prices are affected of these expectations. The following research question aims to be answered in this paper: *How pronounced is the Post Earnings Announcement Drift in small cap listed firms on NASDAQ OMX Nordic Stockholm?* The paper examines 39 randomly selected small cap firms, listed on NASDAQ OMX Nordic Stockholm. Each earnings announcement date is used as a starting point to measure the PEAD in 2009, 2010 and 2011. This research investigates accounting earnings and market return, and analyse thereby the market efficiency.

1.6 Research design

To investigate the effect of quarterly earnings announcements in the capital market, data from the financial market as well as the financial Key Performance Indicator (KPI) EPS is needed. The financial data consists of quarterly EPS, collected manually for each firm investigated, due to the difficulties to reach this data in standard databases (Setterberg, 2011). With a time series model similar to Börjesson and Johansson (2012), the EPS of the previous quarter will be used to estimate the forecasted EPS. The unexpected earnings is estimated by the firm specific EPS minus the forecasted EPS. The unexpected earnings will be divided with the standard deviation of the historical quarterly EPS data in 2006, 2007 and 2008 similar to Setterberg (2011). The Standardized Unexpected Earnings (SUE) will be divided in 10 portfolios, and be resorted for every quarter in 2009, 2010 and 2011, except the last quarter in 2011.

Data from the stock market is needed to estimate the firm specific reaction after earnings announcements. Firm specific net return is calculated according to a model presented by Setterberg (2011). The firm specific stock information consists of data from the last trading day in 2009 and every trading day onwards until the last trading in 2011. The stock information is extracted from NASDAQ OMX Nordic Stockholm homepage. Firm specific dividend needed in the net return model, will be received from Thomason Financial's Datastream database.

In order to estimate the abnormal return in 2009, 2010 and 2011, the market return has to be excluded from the daily net return. The market return model is based on Börjesson and Johansson (2012) where common equity for each firm in 2009, 2010 and 2011 is collected. The common equity is received from the consolidated balance sheet in the financial statement. Firms with similar size of the average common equity will be included in the same market return model. Ten different market indices are formed. The abnormal return will thus be reached by taking the daily net return minus the sample specific market return.

The firm specific quarterly earnings announcement dates will be used in order to investigate the PEAD in the capital market. By adding together each abnormal return the day after the earnings announcement until the day when the next quarterly report are released, quarterly CAR values will be reached. The CAR values are calculated for every quarter investigated.

The quarterly CAR values are added into a buy and hold abnormal return model according to a model by Setterberg (2011). This model enable the researcher to mimic investor behaviour, namely to keep a position (the same shares) in a number of days and monitor the turnover development. This procedure enables the researcher to examine how pronounced the PEAD is in the 39 small cap listed firms. Those firms, which have similar SUE values in a specific quarter, will form a portfolio where the buy and hold abnormal return is used over the period investigated. Worth noticing is that the SUE value affects which CAR values that are added together in the buy and hold abnormal return model. The buy and hold abnormal return will be repeated in each quarter, and in every firm portfolio investigated, except the first quarter in 2009.

The PEAD is found when the SUE is positive (negative) and when the development of CAR points in a positive (negative) direction after the earnings announcement. The positive (negative) SUE demonstrates that the unexpected earnings are positive, which implies that the actual value is larger (smaller) compared to the forecasted value. It is worth mentioning that the PEAD assumes the market to be inefficient, where prices do not equal its actual value, directly after earnings announcement. The true value will, however, be estimated as a drift over time. Therefore, when shares have a positive SUE it indicates that there will be a positive development of CAR values, which is estimated by the buy and hold abnormal return model.

1.7 Relevance and contribution

There are several reasons why responses to earnings announcements are important to investigate. According to Bamber et al (2011) much has happened with the trading activities of shares since the first studies of the post earnings announcement phenomenon in the late 1960's. Due to the IFRS harmonisation project in 2005, the

European stock market has developed in terms of cross boarding trading. Research further reveals that investors prefer to invest in other stock markets, where the same accounting standards are applied (Amiram, 2012).

The empirical research of the predictability of accounting information presented in financial statement has in fact resulted in changes in the accounting standards in the USA. Assuming the capital market as efficient implies that the available information presented in the financial statements is estimated in stock prices. Therefore, accounting authorities in the USA have given the disclosures of the financial statement higher priority, since the information in the notes are equally important as the other information in the financial statements (Ryan et al., 2002). Depending on whether the market is perceived as efficient or inefficient is thus important. This paper contributes to the examination of the efficient market hypothesis. The results are thereby of interest for actors in the capital market, and in the accounting profession specifically (Kothari, 2001). If market prices do not reflect the financial information, perfectly, accounting professionals must act with more prudence. The paper is further important for analysts and investors. Since the paper examines the PEAD of small listed firms, previous research findings can be compared with this paper. This study gives insights in the relation between quarterly earnings and abnormal share return of small listed Swedish firms.

It should be noted that earnings information is only one factor, which affects the volatility in share prices (Setterberg, 2011). A limitation of this research is that it does not consider other factors than earnings news, which affects share prices. In addition, the market liquidity and the global economy influence the value of a firm. The market value can thus be different compared to the underlying value. Firms might be affected differently in the financial years investigated, due to their different business operating after the financial crises. There are, however, only small cap listed firms investigated in the paper, and no comparison is made between larger firms. In order to harmonize the firms and minimize the risk of analyse firms that are not affected in the same way, the investigation only include firms, which have financial year as calendar year.

The time period investigated, must also be considered when scrutinising the result of this paper. Since PEAD are revealed over time, the time period might be too short to fully reflect the implications of PEAD. Due to the time limit and lack of historical data for the firms included in the research, the sample period is restricted to this period. Since much have happened with the trading activities of shares both since the 1960's but also after the IFRS harmonisation project (Bamber et al, 2011; Amiram, 2012) the time period investigated has been decided to be as recent as possible. The year 2012 is excluded since the financial statements were not yet available at time of data collection.

Last but not least, investigating the relation between financial data and market prices contributes in knowledge of how the accounting information is perceived by investors. Despite the fact that PEAD have been analysed in several stock markets on frequent occasions, the research within the Swedish stock market is quite limited (Setterberg, 2011). This research thus contributes to close this knowledge gap.

The paper is organized as follows. Next section drills deep into the core PEAD phenomenon. Since both the financial accounting and finance research are related to the capital market research these will be presented as a background of the phenomenon. Related literature will also be presented. Section three includes a more in-depth research design, presenting prior research models and the definitions used in this paper. Section four presents the result of the study, including a discussion of the previous PEAD research. Section five includes the main findings of the paper and subjects left for further research.

2. Literature review

This paper examines financial information, in terms of the EPS in relation to the share return in the capital market. The aim is to investigate how pronounced the PEAD is in small cap listed firms. To get solid knowledge of the literature connected to the paper, both the development and theory within financial accounting and finance is examined.

2.1 Research in financial accounting

Before the empirical findings of Ball and Brown (1968), in the late 1960's, which were the breakthrough of the post earnings announcement research, accounting theory was overall normative (Kothari, 2001). The normative theory is associated with unwritten rules, on how things should be proceeded. According to DiMaggio and Powell (1983), the cultural context might influence institutional norms as well as powerful stakeholders in sociality. After the 1960's, accounting research started to adopt the positive accounting theory (Kothari, 2001). This theory aims to explain and predict accounting phenomena, in contrast to the normative view (Ryan et al., 2002). Watts and Zimmerman (1978) argue that individual's aims to optimize their own interest in line with the positive accounting theory. Especially the neoclassic idea of the cost and benefit of information, have been central to develop the positive accounting theory further. The cost and benefit of information, implies that the interests of the shareholders are more important than the personal interest. At the long-term perspective the shareholders must be satisfied with the firm and how things are managed, in order for the manager to keep its position. The positive accounting research relies to a large extent on financial theories such as the efficient market hypothesis (Ryan et al., 2002).

2.2 Research in finance

The positivist tradition, mentioned in the financial accounting research, has also a strong connection to the theoretical models used in finance. The positivist approach assumes investors as rational, the market as efficient and that information is free to access. As within most finance research, the capital market occurrence is of the central interest. The finance research thereby differs compared to the financial accounting theory, where the behaviour and contacts between actors are central. Instead, the research in finance assumes investors as rational in order to focus on the market phenomenon. The efficient market assumption is, however, in a number of finance analyses become questioned (Ryan et al., 2002).

2.3 The Post Earnings Announcement research

As mentioned in the beginning of this paper, the post earnings announcement research includes both financial accounting and finance. Accounting earnings information representing the accounting field and the stock price return represents the capital market field. Part of PEAD research question theory based on the efficient market hypothesis. Setterberg (2011), argue that the main argument

among research today is that the PEAD is due to mispricing. Mispricing implies that financial information is not fully examined in share prices immediately in earnings announcements.

2.3.1 Mispricing caused by market frictions

Bernard and Thomas (1989) state that investors, after earnings announcements, have a delayed reaction in the trading of shares. The research investigates New York Stock Exchange (NYSE) and American Stock Exchange (AMEX) listed firms in 1974-1986. A 60-trading day period is used to investigate the drift. Both Bernard and Tomas (1989) and Foster et al., (1984), find that smaller firms have larger drift, both when it comes to positive unexpected earnings as well as negative unexpected earnings, compared with large and medium sized firms. Bernard and Tomas (1989) argue the market to be imperfect and consist of frictions, in which prices are not perfectly communicated, and cause an underreaction by investors. Transaction costs and difficulties to arbitrage are examples of market frictions, which are argued to cause the PEAD.

Bhushan (1994) use an informational efficiency perspective, where prices reflect information only when it is traded, and argues for the existence of transactions costs in the capital market. Bhushan find that firms with high transactions costs are often mispriced, whereas firms with low transaction costs are rarely mispriced. According to Bhushan, a stock with a high volume of trading is assumed to have less trading costs compared to a stock that is less often traded. Bhushan argue further that the different trading costs arise because of the high activity to buy the high volume traded stock. Chung and Harazdil (2011) further confirm transaction costs to be responsible for the PEAD, but only in firms that have information efficiently possessed in their share prices. Chung and Harazdil argue that additional factors, other than transaction cost prevent investors to eliminating PEAD. Ng (2008) argues in addition that there are differences in the mispricing whether the investor is an informed investor or not. A permanent effect is caused in share prices if an informed investor is trading in comparison to a simple noise when an uninformed investor is trading. Since the informed investor always trade when the person gain to do so, the effect is argued to be stronger. Since Ng et al., assume that the informed investor only trade under specific conditions, those firms with high transaction costs are not traded to the same extent as those with low transaction costs. According to Ng et al., (2008) especially small listed firms have higher transaction costs and low institutional ownership. Since smaller firms are less visible and provide investors with less exact information, in comparison with larger firms, it is natural that the transaction costs becomes higher for such firms (Foster et al., 1984). Sadka and Sadka (2009) argue in addition that the stock return of large firms include more information of future earnings compared to small firms. Ng et al., (2010) as well as Baakrishanan et al., (2010), found the PEAD to be especially strong in extreme portfolios of SUE. Since the PEAD research describes the market

expectations in different portfolios, depending on how high the expectation is, the extreme portfolios are those, which have the most negative or most positive unexpected earnings (Setterberg, 2011).

It is worth noticing that Ng et al., (2008) also provide explanations to persistence in PEAD, caused by firms with high transaction costs. The argument put forward by Ng et al., is that informed investors only aim to make profitable trading decisions. The profitable trade in the high transaction cost firms will therefore disappear, because prices are reset so that further trading will be unprofitable. Ng et al., refer to an upper limit to which shares are traded in firms with high transaction costs. The upper limit causes less reaction when earnings announcement are presented.

Barrier to arbitrage is another market friction argued to cause the PEAD, and implies difficulties to gain money on the imperfection in the market (Chordia et al., 2009; Chung & Hrazdil, 2011). Due to noise traders, which do not trade like an informed trader, arbitrages are difficult to perform (Brav et al., 2010). Brav et al., (2010) investigates small US listed stocks and find barriers to arbitrage when the market undervalue shares, hence firms which presents positive unexpected earnings. No support is according to Brav et al., found on shares that are overvalued and that presents negative unexpected earnings.

2.3.2 Behavioural biases and bounded rationality

Another explanation to why investors misprice is due to the human behaviour. Daniel et al., (1998) argue that investors are self-confidence, which cause investors to assume that private information is better compared to the publicly available information. Due to the self-confidence behaviour, mispricing occurs since the available information is not reflected when the investor buy or sell shares. The emotions of the investor are also argued to play a central role, according to Mian and Sankaraguruswamy (2012). Mian and Sankaraguruswamy further argues that the PEAD is more pronounced if an investor responds pessimistic on negative earnings news, and optimistic on positive earnings news. Mian and Sankaraguruswamy (2012) also find in that small, non-dividend-paying stocks tend to have drift in share prices, caused by investor emotions. Similar, Chan et al., (1996) assume that a firm, which presents less profitable returns, trigger an extremely pessimistic behaviour of the investor, which cause the market to misevaluate the true value of the firm. Thus, the market assumes the firm to be worse than it is in reality. This error, according to Chan et al., leads to that the market learns, which, however, might take years to correct (Chan et al., 1996).

An alternative behavioural explanation to the drift is that investors fail to foresee all potential of the announced earnings. Investors do, however, gradually update their expectations after the earnings announcement, which cause a drift in the stock price (Foster et al., 1984; Bartov; 1992; Bernard & Thomas 1990). Barberis et al., (1998)

argue more specifically that it is investor's conservative behaviour that causes mispricing. When an investor is conservative, old information is prioritized before the most recent information. According to Barberis et al., especially when a firm presents negative unexpected earnings, investors tend to become conservative. Another article, which argue of a conservative behaviour of the investor is Chen (2012). Chen uses a buy and hold size adjusted return metric on three American stock exchanges between 1982 and 2004. Chen assumes the earnings persistence to change over time, and therefore model the earnings persistence with a time varying process. According to Chen (2012), investors are particularly conservative owning shares in firms with complex information environments. Chen further argues that conservatism is related to firm size (Chen, 2012).

Francis et al., (2007) argue the drift to be caused by information uncertainty, and a specific learning ability of the investor. Since the market is inefficient and hard to interpret, the authors assume that investors rely on old information. The learning effect would then occur when the investors finally consider the more recent information. The process of learning creates a delayed response of the earning signals. Francis et al., show that firms with high risk and high-expected return, which provide new value relevant information, have especially a high PEAD. Jiang et al., (2005) also show that firms with high information uncertainty cause a larger PEAD. High information uncertainty implies, according to Jiang et al., that it is hard to estimate the true value of a firm. Even though Jiang et al., do not observe the behaviour of the investor, they assume that the investors overweight private information and underweight public information such as the financial statements and quarterly reports. According to Jiang et al., this occurs when investors have information uncertainty.

Chui et al., (2010) and Liu et al., (2003) argues that cultural differences cause the PEAD. Chui et al., (2010) more specifically state that the individualistic countries tend to have greater trading activity as well as drift, compared to other less individualistic countries. The individualistic countries are referred to as the non-emerging countries whereas the less individualistic countries are defined as the emerging markets. Chui et al., find that investors in less individualistic countries, value public information higher compared to private information. Cultural differences hence cause different biases, and allow investors to interpret information differently. Similar findings of Chui et al., are presented by Kremer et al., (2011), who argue that investors in stable environments have more bias in their decision-making. Kremer et al., argue that the normative predictions are important for explaining how investors make their investment decisions in the capital market.

In contrast to Daniel et al., (1998) and Chui et al., (2010), Vega (2006) argue the private and public information to be irrelevant. According to Vega the mispricing in the market is due to the actors, hence the *type* of investors who use the information.

Vega, difference between informed and uninformed traders. The empirical findings show that investors, which possess additional value relevant information, are more likely to trade immediately and thereby cause a smaller PEAD. Vega confirms in addition that smaller firms tend to have a greater PEAD since they are not as transparent as larger firms. A related explanation presented by Hong and Stein (1999), differentiate between informed, and momentum traders. The momentum trader, which equals a naïve impulsive trader, gains money when there is a slow reaction in market prices. The momentum trader causes, according to Hong and Stein, thereby an overreaction in the share price in the long term. Hong and Stein explained the slow reaction in market prices to occur in the first place due to a slow distribution of firm information. Battalio and Mendenhall (2005) further differentiate between large and small investors, and find that the small traders base their trading decisions on less sophisticated information. Battalio and Mendenhall conclude that individuals tend to misprice earnings potentials and cause the PEAD.

In contrast to the research which assume the investors to be naïve and individually cause misprices in the market, Hirshleifer et al,. (2008) states that individual traders cannot explain the PEAD. If individuals actually cause the drift, investors would buy considerably more after extremely negative announcements news and sell considerably more after extremely positive earnings news. Hirshleifer et al., however, find individuals to buy after positive unexpected earnings are presented and sell after negative unexpected earnings are presented. Hirshleifer et al., also find the abnormal trading to be higher for the extremely negative unexpected earnings, in comparison to the extreme positive unexpected earnings. Jacob et al., (2000) argue further that the evidence of naïve investors is overestimated. According to Jacob et al., it is unlikely that a naïve investor would cause the PEAD, since other investors would try to gain on the imperfect prices in the market (arbitrage), which are caused by the naïve investor. If this would be true, the PEAD should disappear and not be found in research.

2.3.3 International findings

Part of research from the USA, finds PEAD to be pronounced in firms with low analyst following and low institutional attention (Livnat and Mendenhall, 2006). It is also noted that small firms have less analyst following and institutional attention in general, compared to large firms (Bhushan, 1994; Ng et al., 2008).

Despite the fact that PEAD is analysed to a larger extent in the US stock market (Barber et al., 2012), there are also international findings of PEAD outside the US boarders. Booth et al., (1996) investigates 31 Finnish firms listed on the Helsinki Stock Exchange (HSE) in 1989-1993. Booth et al., use a market adjusted return measure in 10 days after earnings announcements and find a larger drift after positive unexpected earnings compared to the drift measured after negative

unexpected earnings. Especially firms that do not use income smoothing seem to have a larger PEAD.

Based on Foster et al., (1984) and Bernard and Thomas (1989) Hew et al., (1996) analyse the existence of PEAD at the London Stock Exchange (LSE) between 1989 and 1992. The research investigates 206 firms. Hew et al., (1996) find no statistic significant relation between large listed firms and PEAD. PEAD is only significant for earnings announcements provided by small firms. According to Hew et al., the result might be due to that little attention is paid on small firms. Liu et al., (2003) also investigate the UK stock market but are unable to relate PEAD to firm size. Liu et al., base their research on previous research of Chan et al., (1996) and find evidence that the UK stock market is inefficient, and that investors underestimating earnings information.

Setterberg (2011) claim to be the first extensive PEAD research in Sweden. The research investigates 130 firms listed on NASDAQ OMX Nordic Stockholm large cap, in 1990-2005. Based on models by Bernard and Thomas (1989), Setterberg (2011) prove evidence of PEAD in the Swedish stock market. Setterberg investigate the stock market per month and find a significant drift if the holding period is extended from six up to 12 months. Additional research where Sweden is included are presented by Griffin et al., (2008) and Barber et al., (2012). Griffin et al., (2008) perform an international study in 1994- 2005 and investigate 22 developed countries and 36 countries from emerging markets. With a random sample of five firms per country, Griffin et al., find that PEAD has cross-country differences. The reaction of PEAD is largest for developed markets after earnings news. Griffin et al., find that the variation especially is due to insider trading, which cause information leakages and thereby a less pronounced PEAD. Countries with less insider trading have, according to Griffin et al., larger PEAD. Freedom of the press is also found to explain the differences among countries. More than half of the differences in the average reaction can be explained of this cause. Barber et al., (2012) on the other hand, find PEAD to exist across the globe investigating 46 countries in total. The research find in addition the PEAD to be larger for small listed firms, compared to large once. Firms with a market capitalization below 1 million US Dollar are excluded from the investigation.

2.3.4 Miscalculations of abnormalities

Konchitchki et al., (2010) argue the capital market to be efficient and that investors do not miscalculate earnings news, in contrast to what has been mentioned of the PEAD research above. Konchitchki et al., (2010) also show that a random walk model used to estimate unexpected earnings express less PEAD compared to a model of analyst forecast errors. On average the drift returns are reduced by 35 percentage (Konchitchki et al., 2010). The anomalies in the capital market can thus be due to experimental design choices, which influence the result (Foster et al.,

1984; Taylor & Wong, 2010; Konchitchki et al., 2010). According to Taylor and Wong (2010), the existence of abnormality in the capital market is not an easy yes or no question; it depends on many different circumstances taken together.

2.4 Discussion

To sum up, PEAD can be caused by several factors. Derived from the previous research, PEAD might be due to behavioural biases. Some argue that the investor's choice between private and public information matters in the trading, which causes PEAD (Chui et al., 2010) whereas other research argues the type of investor to cause PEAD (Hong & Stein, 1999; Battalion and Mendenhall, 2005; Vega, 2006). Hirshleifer et al., (2008) and Jacob et al., (2000), on the other hand, are both sceptical that individuals cause PEAD. The research also states that market frictions cause the PEAD phenomena. Ng et al., (2008) provide, however, both explanations toward the PEAD existence and persistence using transaction costs. According to Chung and Harazdil (2011) additional factors are needed to explain PEAD, other than the transaction costs alone.

Despite the diffusion of the explanation of PEAD by the previous research, there are indications of a pronounced PEAD in small listed firms (Foster et al., 1984; Bernard and Tomas, 1989; Hew et al., 1996). Small firms are found to be less transparent and to cause information uncertainty, and it is also harder to reveal the underlying value of these stocks (Jiang et al., 2005; Vega, 2006; Sadka & Sadka, 2009). Sadka and Sadka (2009) argue in addition that the stock return of large firms includes more information of future earnings, compared to the stock return of small firms. Despite the different explanation towards PEAD, some of the behavioural explanations are especially connected to small firms. Mian and Sankaraguruswamy (2012) state for example that small, non-dividend-paying stocks tend to have a drift in the share price after earnings announcements, caused by investor emotions. Especially firms, which present less profitable returns, trigger an extremely pessimistic behaviour of the investor, which cause a misevaluation of the true firm value (Chan et al., 1996). Another example is Chen (2012) who argues that investor conservatism is related to firm size and complex information environments. Chen argues that the smaller the firm is, and the more complex information it includes, it is more likely that the investor relies on past information. Further signs of the existence PEAD in the Swedish stock market are related to cultural aspects (Chui et al., 2010). Kremer et al., (2011) mention for example that investors in stable environments have more biases in their decision-making, which are related to the PEAD. Chui et al., (2010) additionally argue individualistic countries to prioritise private information in comparison to public information, which causes a larger PEAD.

Powell and DiMaggio (1983) state, however, that institutions and unwritten rules vary across cultures and countries. Different cultures and norms are further argued to result in different investment decisions of the investors (Kremer et al., 2011). This

paper might therefore result in different findings compared to Foster et al., (1984) and Bernard and Tomas (1989) who investigate the American stock market. There are, however, additionally researches that find the PEAD within Europe (Booth et al., 1996; Hew et al., 1996; Liu et al., 2003) and NASDAQ OMX in Sweden (Setterberg, 2011) along with other international studies (Booth et al., 1996; Griffin et al., 2008; Barber et al., 2012). This indicates that the PEAD is not a phenomenon, which is only exists in the US stock market. It is in addition claimed that small listed firms in general has lower institutional ownership in comparison to large firms (Bhushan, 1994; Ng et al., 2008).

Chui et al., (2010) argue that the trading activity is an important explanation to why the PEAD occurs to a larger extent in the western world. In contrast to the transactions cost research (Ng et al., 2008) Chui et al., (2010) show that a higher trading activity cause a larger PEAD. It can, therefore be assumed that a less pronounced PEAD is found, investigating small listed firms. The international study by Barber et al., (2012), on the other hand, find PEAD in both emerging and developed markets around the world. Barber et al., find in addition an especially pronounced PEAD in small firms. The low amount of analyst following also indicates that PEAD is found when investigating small listed firms (Bhushan, 1994; Ng et al., 2008).

Francis et al., (2007) provide another perspective and state that firms that provide the investors with new value relevant information in their earnings announcements also present high PEAD. Francis et al., argue that there is information uncertainty among investors before the earnings announcements, but that the value relevant information presented triggers a learning ability of the investor, which causes PEAD. The fact that the research in this literature review is more of the opposite when it comes to transparency of small listed firms (Foster et al., 1984) would indicate that the PEAD would not be found in this paper according to Francis et al., (2007). On the other hand, the lack of transparency and the lack of value relevant information are also used to explain the existence of the PEAD (Jiang et al., 2005; Vega, 2006).

Worth noticing is, however, that the behavioural finance explanations of the investors underreaction have been criticised due to lack of robustness (Van der Sar, 2004), to be sample specific and unable to give a holistic explanation to the PEAD (Fama, 1998). This weakens the investor biases explanation to explain PEAD, and also the expectations of this paper. There are, however, research examined that find PEAD is especially pronounced in small listed firms, also in the European stock market (Hew et al., 1996). Of course is should not be neglected, that specific design choices can cause the PEAD (Foster et al., 1984; Taylor & Wong, 2010; Konchitchki et al., 2010). There are for example, no research examined which investigate 2009, 2010 and 2011. The assumptions related to the research design will be discussed in further detail the third chapter of this paper.

3. Methodology

3.1 Introduction

This chapter aims to specify how the research question will be answered, namely how pronounced the PEAD is, investigating small cap listed firms in Sweden. This includes clarifications of how the expectations of quarterly EPS for the 39 small cap listed firms will be investigated. Also the explanations of how the return of share prices will be measured and more detailed information of how the expectations are reflected in market return, hence how the drift will be measured.

The models of previous research used to examine the PEAD are presented next, in order to give the reader a broader view of this research area, and also to be able to form a discussion about the chosen method. The time series model, the SUE measure, the CAR measure and the buy and hold abnormal return are to be presented in further detail in the *3.4 Definitions*. The specific definitions used are critically developed from previous research. The chapter also include critiques of PEAD, which must be considered when reading the results of this paper. A presentation of the 39 collected sample firms can be found in Appendix 1.

3.2 Models

Earlier studies, which investigate earnings announcement and the effect on the market return, have found a drift in the share prices resulting in an abnormal return after earnings announcements. Since this kind of research both investigates the accounting earnings and the market return, several models are needed in order to investigate the PEAD (Chan et al., 1996; Liu et al., 2003).

3.2.1 Models used on financial data

Research within the PEAD use something called *earnings surprise* or *unexpected earnings* which both equals the difference between actual and expected earnings from the investors. The earnings surprise is thus central in order to estimate whether there is a high or a low expectation on the share. Quarterly EPS and quarterly earnings before extraordinary items and discontinued operations are common earnings measures used in prior research (Bernard & Thomas, 1989; Soffer and Lys, 1999; Setterberg, 2011).

The expected earnings, which are part of the measure to estimate unexpected earnings (or the so called earnings surprises), can be reached in different ways. Below in Figure 3.1 is one example of the analyst forecast model presented by Liu et al., (2003). The analyst forecast model uses values from analyst expectations, often provided from an Institutional Brokers Estimate System (I/B/E/S) database (Chan et al., 1996; Liu et al., 2003). Please note that this specific analyst forecast model analyse the PEAD after six months, and is thereby referred to as “REV 6”.

Figure 3.1 Analyst forecast measure of earnings surprise measured per month

$$REV6 = \sum_{s=1}^{6} \frac{FY1_{j,\,t-s+1} - FY1_{j,\,t-s}}{P_{j,\,t-s}},$$

Where:
$FY_{j,\,T}$ is the median of analyst forecast earnings in month t
$P_{j,\,T}$ is the stock price at the end of the month t
(Liu et al., 2003 p. 93)

Another model used to examine the expected earnings is the time-series model, where the expectation values are partly based on historical data and a drift term. Both Foster et al., (1984) and Setterberg (2011) include a time-series model; see Figure 3.2 and Figure 3.3 below.

Figure 3.2 Time-series model

$$\left[Ear_{i,t} - Ear_{i,t-4}\right] = \alpha_i + \beta_i \times \left[Ear_{i,t-4} - Ear_{i,t-8}\right] + \varepsilon_i$$

Where:
$Ear_{i,t}$ = quarterly earnings for firm i in quarter t
α_i = firm specific intercept
$b_{i,t}$ = autoregressive term for firm i in quarter t
$e_{i,t}$ =residual for firm i in quarter t
(Setterberg, 2011 p.45)

The model of expected earnings by Foster et al., (1984) is more simplified:

Figure 3.3 Forecasted earnings (expected earnings) based on a time series model with drift term

$$E\left(Q_{i,t}\right) = Q_{i,t-4} + d_i$$

Where:
$Q_{i,\,t-4}$ is the actual earnings for firm i in time t four quarters ago
δ_i is the drift term for firm i
(Foster et al., 1984 p. 582)

The time series model used in research can, comparing the figures above, look quite different. The model applied by Setterberg (2011) is more developed and includes more firm specific information, compared to the model by Foster et al., (1984). An additional model applied in research which investigate earnings surprise (the unexpected earnings) with help from the time series model, normally include a

standard deviation to reach SUE. Figure 3.4 is one example presented by Chan et al., (1996):

Figure 3.4 Standardized Unexpected Earnings

$$SUE_{i,t} = \frac{e_{i,q} - e_{i,q-4}}{s_{i,t}}$$

Where:
$e_{i,q}$ equals the actual quarterly EPS
$e_{i,q-4}$ equals EPS four quarters ago
$\sigma_{i,t}$ is the standard deviation for unexpected earnings, based on eight historical quarter (Chan et al., 1996 p. 1685)

3.2.2 Market return models

In order to measure if there is a similar surprise in the market, the post earnings announcement research use a market-based measure on the stock fluctuations around the earnings announcement date. Similar to the previous models, the aim is to find the unexpected value in the market, which is defined as abnormality. The abnormality of the stock is then measured over time. The duration varies among research (Kothari, 2001) and also if the drift is measured in financial quarters or months (Setterberg, 2011).

The actual stock return can be estimated in the following way, see Figure 3.5 below:

Figure 3.5 Firm specific stock return

$$R_{i,t} = \frac{P_{i,t} + DIV_{i,t}}{P_{i,t-1}} - 1$$

Where:
$R_{i,t}$ = is the net return of share *i* at time *t*
$P_{i,t}$ = is the price of share *i* at time *t*
$DIV_{i,t}$ = is the net dividend of share *i* at time *t*
(Setterberg, 2011 p.47)

A value-weighted market index can be calculated like Figure 3.6 below.

Figure 3.6 Model of market index

$$rm_t = \frac{Index_t - Index_{t-1}}{Index_{t-1}}$$

(Börjesson and Johansson, 2012 p. 26)

The abnormal return is reached from the stock return minus the market return (Chan et al., 1996), estimated in Figure 3.7 below. When cumulating every abnormal return over a specific period CAR is reached, see Figure 3.8.

Figure 3.7 Market measure of abnormal return

$$ABR_{i,t} = \sum_{j=-2}^{+1} (r_{i,j} - r_{m,j})$$

$r_{i,j}$ = firm *i*'s return day *j*
$r_{i,m}$ =return of a equally weighted market index
(Chan et al., 1996 p. 1685)

Figure 3.8 Cumulated Abnormal Return

$$CAR_{i,T} = \sum_{T} AR_{i}$$

(Bartov, 1992 p. 614)

In the research by Setterberg, a buy and hold abnormal return is used in order to reach the abnormal return for every portfolio over the sample period, Figure 3.9.

Figure 3.9 Buy and hold abnormal return model

$$BHAR_{P,T} = \frac{1}{N} \sum_{i=1} BAHR_{i,T}$$

Where:
$BHAR_{P,T}$= buy and hold return for portfolio *p* after *T* months,
P= type of portfolio,
N= number of firms in portfolio *p, i= 1, 2,*
$BHAR_{i,T}$ = buy and hold return for share *i* after *T* months.
(Setterberg, 2011 p. 48)

Both CAR and the buy and hold abnormal return presented by previous research accounts for the abnormalities generated from the price changes in the stock, after earnings announcements. Chan et al., (1996) and Liu et al., (2003) use the measure of abnormalities is a four-day procedure. The stock return is thereby measured in a four-day interval after earnings announcements. Bernard and Thomas (1989) use the buy and hold abnormal return on a 60- trading day period whereas Setterberg (2011) analyse the stock market with the abnormal return measured every month in the sample period and analyse the drift in a total of 6 and 12 months. Worth mentioning is that the research which investigating longer durations, normally measure the drift from the upcoming month and onwards whereas shouter duration methods use the earnings announcement date (Kothari, 2001).

3.3 Research design

This paper is centred on earnings announcements of quarterly EPS, the most common earnings measure used to examine (Setterberg, 2011). In order to estimate the effect of quarterly earnings announcements for 39 small cap listed firms, this research is based on models developed by previous research. Similar to the previous research, unexpected earnings will be used to rank the 39 firms dependent of their size of SUE. Firms with high quarterly expectations will be placed in the portfolio 1-5 and firms with low quarterly expectations (unexpected earnings) will be placed in portfolio 6-10. The abnormal returns, generated from the market return models will be calculated and cumulated for each of the ten SUE portfolios. As will be explained in further detail in *3.4 Definitions*, the abnormal return is the difference between the net return and the market return. The ranking procedure is also explained in further detail in *3.3.2 Portfolio formation based on SUE*. Based on the previous post earnings announcement research, portfolios with high expectations also assumes to have a positive drift in share return over time, whereas portfolios with low expectations assume to have a negative drift in share return over time. Using financial models and market return models, which are more discussed below, the researcher aim to analyse how pronounced the PEAD is in the 39 small cap firms in 2009, 2010 and 2011.

3.3.1 Models used on financial data

The models used on financial data include earnings expectations and unexpected earnings and will be used in order to estimate the SUE. The aim of these models is to estimate the quarterly expectations, derived from the EPS.

This research includes a time series model in order to estimate the expected earnings. The time series model is the model most frequently used in research to predict expectations of earnings (Livnat & Mendenhall, 2005). The time series model applied in this research is, however, somewhat different to the time series models presented in *3.2.1 Models used on financial data*. The drift term will be excluded since it is not needed, analysing quarterly data (Bernard & Thomas, 1990). The seasonal component is also removed since the sample firms are assumed to have seasonal fluctuations, similar to the study by Börjesson and Johansson (2012). The time series model used in this research is rather pragmatic. It can be argued that a more developed time series model would account the expected values more correctly. The model applied by Setterberg (2011), however, do account for several firm specific components, which will not be possible to perform in this time-limited master project. In addition, Foster et al., (1984) show in their research that there is not much of a difference of the final result, using the simplified time series model compared to a time series model which include more firm specific values.

Livnat and Mendenhall (2005) argue furthermore, that it is better to use more than one model to estimate earnings forecasts. Due to the limit amount of data, however, an additional model of calculating earnings expectations such as the analyst forecast

model is not applied in this research. Despite the fact that analyst forecast provide more timely earnings surprise, according to Livnat and Mendenhall, it is not applied in this paper. The database to use from Gothenburg University, from where analyst forecast is provided, is Datastream. Since Datastream lack to a large extent analysing small listed Swedish firms, the analyst forecast model is not possible to use in this study.

Next, after the earnings expectations are estimated for each quarter with the time series model, the unexpected earnings will be calculated in order to reach the quarterly SUE. In order to provide reliable data, independent of firm size (Foster et al,. 1984) the unexpected earnings are scaled with a firm specific standard deviation of the nine historical quarters, hence EPS data from 2006, 2007 and 2008. The use of nine previous quarter data is similar to Setterberg, and decreases look ahead biases which otherwise might occur (Setterberg, 2011). Worth noticing is that a sample standard deviation *s,* is used instead of the population standard deviation, expressed in *3.4 Definitions*. The SUE give a direct measure of earnings surprise and are in fact the most common measure used among PEAD studies (Liu et al., 2003). A drawback using this model is, however, the risk of creating a specification error when calculating the forecast of earnings (Chan et al., 1996), which would result in incorrect SUE values. The researcher is aware of this problem and has in order to reducing this risk followed the methods of previous research.

3.3.2 Portfolio formation based on SUE

Since previous research sort analysed firms dependent on the size of the standardized earnings expectations, this will be done in this study (Bernard and Thomas, 1989). The use of portfolios enables the researcher to analyse the 39 firms more comprehensively, by including firms with similar SUE values in the same portfolio, instead of analysing one by one. The portfolio formation, based on the SUE values, is made each quarter, which implies that different firms are found in different portfolios depending on the specific quarter investigated. The ranking procedure is performed in 11 quarters (Q1 in 2009 – Q3 in 2011) and is presented in Appendix 3. The fourth quarter in 2011 is not included in the ranking since the research is delimitated to investigate the drift in 2009, 2010 and 2011 hence from the second quarter in 2009 - fourth quarter in 2011. Worth noticing is that the effect of the earnings surprise (unexpected earnings) is measured in the following quarter after the earnings surprise, and forward. This implies that the drift of the earnings surprise in the first quarter of 2009 is measured with the abnormal return from the second quarter in 2009 until the fourth quarter in 2011. The abnormal return will be explained in more detail in *3.3.3 Market return models*.

Ranking the SUE values enables the researcher to analyse the firms with extremely good expectations and those with extremely bad expectations, which according to Baakrishanan et al., (2010) and Ng et al., (2010), include the largest amount of

positive and negative PEAD. This research follows Bernard and Thomas (1989) and Setterberg (2011), who use 10 SUE portfolios. Portfolio 10 includes the most negative SUE of the 39 firms whereas Portfolio 1 includes the most positive SUE values. Since the research investigates an uneven amount of firms, portfolio 5 includes three firms, whereas the other portfolios include four firms each. Portfolio 5 was chosen to include a smaller amount of firms since it will not be classified as an extreme portfolio and will therefore not include any extreme SUE values.

Despite the fact that models are based on previous research, this paper's sorting procedure of the SUE portfolios is somewhat different. What is different compared to Setterberg (2011) is that all firms investigated in this research present *both* positive and negative SUE values during the sample period. E -mail contact with Hanna Setterberg, who wrote the actual research in 2011, is made regarding this matter. No firm, which presents partly positive and partly negative quarterly SUE values in 2009, 2010 and 2011, will be excluded from this research.

3.3.3 Market return models

The market expectation models applied in this research aim to investigate the abnormal return of the 39 stocks. By adding together the abnormal return both quarterly and together with the firms in the same portfolio, defined as an average value, the drift in share return can be estimated.

The first market-based model applied is the firm specific net return based on Setterberg (2011). The net return is descried in more detail in *3.4 Definitions* and consists of share and dividend data of each of the 39 stocks investigated. The model is followed since it has been used by previous research.

The net return will be adjusted with a market index in order to reach the abnormal return. The aim is to reduce the net return with a comparable index (Börjesson & Johansson, 2012). Since every firm in this paper is randomly chosen from the small cap list, the researcher assumes that there are differences in firm size, which has to be considered investigating the firm return. The paper therefor includes 10 market indices, calculated from the firms investigated. The design of the market indices is based on Börjesson and Johansson (2012) and will be explained next. The firms are first, similar to Börjesson and Johansson (2012), sorted based on the average size of common equity during 2009, 2010 and 2011. Firms with similar size on the average common equity will be put the same index group. Each group of firms will then construct an index based on the trading information from 2009-12-31 to 2011-12-31. The firm specific net returns minus the firm specific market index will then result in the abnormal return, calculated for each day of 2010 and 2011. The CAR value will then be measured after the earnings announcement day and cumulated all values estimated from that stock until next earnings announcement. Since the research investigate an uneven number of firms, one of the market portfolios

includes three firms, and the others market portfolios, four firms each. The firms with the lowest average of common equity are chosen to include the lowest amount of firms. Since the extreme SUE values vary, none of the market portfolios where more suited to include the three firms, every market portfolio is equally important.

Worth noticing is that the market index is quite pragmatic and based on maximum four firms, which implies that extreme values have large effect in each index, especially the specific market index, which includes three firms. Due to the time consuming process, and limited amount of time writing this theses, the sample do only include 39 firms. The sample selection will be explained in further detail in *3.5 Sample and Data* below. An advantage of the indices is however, that only firms, which are included in this research, are used in the calculation of the market indices. Another reflection of the market index is that it is based on common equity and not on the market capitalization. It can be questioned whether the actual size differences are taken in to consideration with this market index, since the common equity does not have to be related to firm size to the same extent as market capitalization. This might therefore effect the CAR values estimated in this research (Börjesson & Johansson, 2012). On the other hand, all firms investigated apply IFRS, which increases the comparability among the firms in general. Furthermore, holding and investment firms, who own shares in other firms, are excluded from the research. More information of the sample selection is found in *3.5 Sample and Data* below.

A buy and hold abnormal return model, which aims to mimic investor behaviour, will further be used (Setterberg, 2011). The quarterly CAR values will be added together with the firms, which belongs to the same SUE portfolio. Dependent on the SUE values, firms, which have the same size of SUE in the first quarter in 2009 for example, is analysed together. This implies that the CAR value of firms, which quarterly, belongs to the same portfolio is added together. The abnormal return is equally weighted; the portfolio return is thus reached by dividing it by the number of portfolio firms, similar to Setterberg (2011). The buy and hold abnormal return suggest that the portfolio is formed, which is dependent on the SUE value, and cumulated thereafter, over the sample period. As mentioned above, this measure is similar to investors in the capital market and therefore useful in this research. The buy and hold abnormal return enable the researcher to study the drift graphically but is, however, hard to study statistically. According to Setterberg (2011) this is the case since the values are often skewed and not normally distributed around zero. Liu et al., (2003) argue, however, that the buy and hold return model measure all news and not the earnings news exclusively. All fluctuations which have effected the stock is included, not only those related to earnings announcements. The buy and hold abnormal return is, however, well suited in this type of research analysing the capital market (Setterberg, 2011).

3.4 Definitions

This part of the methodology aims to, in detail, describe the models applied in the research design.

3.4.1 Measure forecasted earnings

Forecasted earnings are calculated comparing the EPS in quarter *q* with the reported earnings of the previous quarter (Börjesson & Johansson, 2012). Firm specific information is used in order to reach firm specific valuation.

$$Forecasted\ earnings = EPS_{i,\,q-1}$$

3.4.2 Measure unexpected earnings

The unexpected earnings (earnings surprise) are defined as the difference between actual and forecasted earnings. When the actual earnings are lower than the forecast, the unexpected earnings are negative and are thus referred to as negative earnings news. When the actual earning is greater compared to the forecast, this is referred to as positive earnings news.

$$Unexpected\ earnings = EPS_{i,\,q} - EPS_{i,\,q-1}$$

(after Börjesson & Johansson, 2012 p. 22)

Scaling the unexpected earnings, a firm specific SUE value is reached:

$$SUE_{i,t} = \frac{unexpectedearnings_{i,t}}{s_i}$$

Where:

Unexpected earnings $_{i,\,t}$ is the difference between the actual earnings for firm *i* in time *t* and the expected earnings for firm *i* in time *t*

$s_{i,}$ is the sample standard deviation for firm *i*

The standard deviation in this research is based on historical data of quarterly EPS in 2006, 2007 and 2008, for all the 39 firms investigated. Since a sample of 39 firms is investigated in this research, the SUE measure will in contrast to previous research be scaled with the sample standard deviation *s,* instead of the population standard deviation σ. Based on Anderson et al., (2009) the sample standard deviation is expresses as:

$$s_i = \sqrt{s_i^2} = \frac{\sum (x_{i,t} - \bar{x})^2}{n - 1}$$

Where:

$x_{i,t}$ is the EPS for stock *i* in quarter *t*

$\bar{X}$ is the sample mean of the EPS based on the nine previous quarter data before the sample period
n is the number of firms observed
(after Anderson et al., 2009 p. 75 & 77)

The sample mean is found in Appendix 2.

3.4.3 Measure of earnings

The monthly net return, $R_{i,t}$ is based on Setterberg (2011) and calculated for each stock:

$$R_{i,t} = \frac{P_{i,t} + DIV_{i,t}}{P_{i,t-1}} - 1$$

Where:
$R_{i,t}$ = is the net return of share *i* at time *t*
$P_{i,t}$ = is the price of share *i* at time *t*
$DIV_{i,t}$ = is the net dividend of share *i* at time *t*
(Setterberg, 2011 p. 47)

The index of market return (Rm) is calculated from the firms included in this research. Following the research by Börjesson and Johansson (2012) the firms will be sorted based on the size of common equity during the sample period and put in ten separated groups. This procedure is found in Appendix 4 and 5. Each group of firms, based on the trading information from 2009-12-31 and 2011-12-31, will then be calculated as an index. Each index is then used to calculate $Rm_{t,}$ which can be expressed as:

$$Rm_t = \frac{Index_t - Index_{t-1}}{Index_{t-1}}$$

(Börjesson and Johansson, 2012 p. 26)

To reach the CAR value the abnormal return (AR) must be estimated for each stock in each firm quarter. Following Setterberg (2011) AR is estimated as:

$$AR_{i,t} = R_{i,t} - Rm_t$$

Where:
$AR_{i,t}$= is the abnormal return of share *i* at time *t*
$R_{i,t}$= is the net return of share *i* at time *t*
Rm_t= is the market return
(Setterberg, 2011 p. 47)

The CAR value will be measured for each firm from the earnings announcement date and the last day of that quarter. CAR is the sum of all abnormal returns (AR), thus:

$$CAR = \sum AR$$

In order to reach the portfolio return of the 10 SUE portfolios the firm's quarterly CAR value is added together with other firms that belong to the same portfolio. The stocks will be equally weighted and the portfolio return is reached by dividing it by the number of portfolio firms. (Setterberg, 2011) In this way a buy and hold abnormal return is reached.

$$BHAR_{P,T} = \frac{1}{N}\sum_{i=1} BAHR_{i,T}$$

Where:
$BHAR_{P,T}$ = buy and hold return for portfolio *p* after *T* quarters,
P= type of portfolio,
N= number of firms in portfolio *p, i= 1, 2,3…10*
$BHAR_{i,T}$ = buy and hold return for share *i* after *T* quarters.
(after Setterberg 2011 p.48)

3.5 Sample and data

Small listed firms on NASDAQ OMX Nordic have a market value smaller than 150 million Euros (NASDAQ OMX Nordic, 2011). The sample selected consists of 39 small cap listed firms. Investigating 39 firms include 780 quarterly observations of EPS, historical data in 9 quarters plus the 11 quarters investigated. The market data used in this research is based on the market valuations on the 30th December 2009 - 30th December 2011.

The three years, 2009, 2010 and 2011 is chosen in order to use the most recent data after the IFRS harmonization project. The year 2012 is excluded since the financial statements were not available at time of data collection. The researcher is aware of the fact that a longer time frame might indicate the drift differently.

Due to the time limit, the sample is restricted to include every second firm of the 130 firms listed on the small cap NASDAQ OMX. Out of the 65 randomly selected firms, 26 firms in total are excluded. Firms that did not use a calendar year as financial year, 2 firms in total, are excluded similar to Booth (1996). In addition, the firms, which have been listed on the small cap list less than eight years, 9 firms, or changed name over the period, 2 firms, are excluded due to the lack of historical data. Holding and investment firms, 7 firms, are excluded due to their type of

business of owning shares in other firms. Last, firms that missed any values when data was collected, 6 firms, are additionally excluded. The sample consists of 39 firms from the small cap list. According to Krejcie and Morgan (1970) a population of 100 units should use a sample size of 80, whereas a population of 200 needs a sample of 132 units. Since the research investigates a population of 130 units, the sample size of 39 units is too small in order to draw any generalizable conclusions on the data. The researcher is aware of this limitation, and also the difficulties to draw general conclusions of the small cap list. The small sample size is chosen due to the time consuming manual data collection, explained in further detail below.

The quarterly EPS will be hand collected from firm specific quarterly reports from the last quarter in 2006 until the last quarter in 2011, which equals 21 quarters in total. The researcher chooses to use the EPS before dilution for every stock to be able to compare the data. Hand collecting the EPS is of course a time consuming process compared to if the EPS would be collected from Datastream directly. The manual procedure is chosen due to the lack of data in standard databases. The fact that the time series data in Datastream is based on yearly EPS and then divided into equally values the following three quarters, will not enable the researcher to investigate the quarterly earnings fluctuations. Datastream furthermore miss negative EPS, which also strengthen the unsuitability to collect the EPS from Datastream. The researcher assumes the process of collecting the EPS manually strengthens the research, in terms of investigating the actual quarterly fluctuations. The earnings announcement dates are also collected manually from firm specific homepages, due to the lack of information in standard databases, such as Orbis, which is recommended by Economic library.

The common equity is based on the share capital of the consolidated statement in the financial statement during 2009, 2010 and 2011 and is also collected manually. Out of the 39 firms, 17 are either listed as an A- or a B-share. The common equity is therefore adjusted by dividing the share capital with the amount of shares and then multiplying this value with the specific number of A- or B shares presented in the financial statement.

The monthly dividends, used in the monthly net return metric, is reached from Datastream. The historical dividend is reached by using a relative period from -51 months till -15 month, since this data was collected in March 2013. Each dividend period is exported to Excel.

The stock prices for each firm between the last trading day in 2009 and the last trading day in 2011 are collected from the NASDAQ OMX Nordic Stockholm homepage. The closing share price for each trading day, similar to Liu et al., (2003) has been used and exported to Excel. Using the closing share price, instead of an

average share prices value, implies that values are presented on every trading day, even if no trading actually is made.

3.6 Critiques of the Post Earnings Announcement Drift research

As mentioned in the literature review, experimental design choices, has been put forward and argued to influence PEAD (Foster et al., 1984; Taylor & Wong, 2010; Konchitchki et al., 2010). Articles have in addition estimated the PEAD and find the drift to vary depending on the models used. Liu et al., (2003) find the strongest drift with an ARD4D model. The ARD4D model measures the abnormal return in share prices in a 4-day period around the earnings announcements. The other models used by Liu et al., that also show PEAD but not to the same extent, is the SUE valuation and an analyst forecast.

Livnat and Mendenhall (2006) compared the time-series unexpected earnings collected from the database Compustat and analyst forecast collected from I/B/E/S. Livnat and Mendenhall found the drift to be considerable larger with the analyst forecast errors from I/B/E/S. Worth noticing is that the research by Livnat and Mendenhall is made in the USA, and that neither the I/B/E/S nor Compustat is used in this paper. Similar findings are presented by Konchitchki et al., (2010) who state the random walk model (similar to the time series model) used to estimate unexpected earnings show on average a 35 percentage smaller drift compared with a model of analyst forecast. Furthermore, Foster et al., (1984) only find the PEAD in two out of four models applied in their research.

The time period investigated has also proved to matter when determining the drift (Foster et al., 1984). However, recent studies have used longer time periods and, still find PEAD, see for example Baakrishnan et al (2010) and Chung and Hrazdil (2011). This indicates that there are other explanations than solely methodical errors, which are behind the PEAD (Johnson & Zhao, 2012).

3.7 Discussion

As mentioned, the methodological choices defined in this chapter, are relevant in order to evaluate the findings of this paper. Critical aspects are the models applied, the sample size and the time period analysed.

Despite the fact that the models are provided from previous research, the market index based on Börjesson and Johansson (2012) is quite pragmatic. As mentioned in *3.3.3 Market return models* it can be questioned whether the actual size differences are taken into consideration with this market index, based on common equity. Holding and investment firms are, however, excluded from the sample and the indices are only based on the firms included in this paper. The time series model can also be discussed to be pragmatic of estimating forecasted earnings. Foster et al., (1984) state, however, that there are little differences in the result when using a simplified model of time series compared to a more complex model. Due to time

consuming process of collecting data manually, a somewhat pragmatic time series model is chosen. More over, the ranking procedure of SUE portfolios, mentioned in section *3.3 Research design* is not able to follow previous research. The result might therefore be different compared with other studies, which is able to estimate the drift after the earnings announcements.

As discussed in *3.6 Critiques of the PEAD research* the short time period investigated might also effect the result (Foster et al., 1984). Especially since it is years close to the financial crises in 2008, the reaction in the stock market might be different compared to findings of previous research investigating other stock lists and time span compared to this paper. The sample size itself, which is discussed in section *3.5 Sample and Data* is furthermore not large enough to provide generalizable conclusions (Krejcie & Morgan, 1970). Using an uneven amount of firms effects both the SUE portfolios and the market index portfolios, which is discussed in *3.3 Research design*. The researcher is aware of the difficulties and limitations mentioned and have in order to minimize them, based the models and metrics from previous research to the extent that was possible, in order to strengthen the outcome of the methodical procedure.

Another drawback in the research design is that it does not include statistical probability test. Setterberg (2011) argue, however, that there is difficulties to test the buy and hold abnormal return model. On the other hand, previous research performs additional tests of the results, such as the three-factor model by Fama. Due to the time limit of writing and performing this research, significance tests is not included in this paper.

As mentioned, the data is collected from the NASDAQ OMX Nordic Stockholm homepage and from quarterly and financial statements, which are assumed to be of good quality. Calculations are made in Excel where the different sheets are linked to the original source of information. The calculations is further made exactly the same for every firm investigated. Since this paper aims to measure quarterly earnings, the EPS have to be quarterly in order to investigate the research question. This strengthens the research in comparison if EPS would be collected from Datastream. The actual earnings announcements dates, which also are collected manually, strengthen the investigation in terms of measuring the exact day from which earnings announcement is released.

4. Results

This chapter aims to answer how pronounced the PEAD is in small cap listed firms on NASDAQ OMX Nordic Stockholm using a sample of 39 firms. First, a description of the collected data is presented. The variables presented are: forecasted earnings, unexpected earnings, SUE and CAR, which is used to estimate PEAD in the 39 small cap listed firms. The analysed quarter values of SUE are distinguished between those that are positive and negative in order to investigate the positive abnormal return as well as the negative abnormal return in the capital market. The chapter further includes reflections on why the result is found.

4.1 Sample presentation

Table 4.1 Descriptive Statistics of forecasted earnings, unexpected earnings, SUE and CAR (SEK).

	Nr observations	Range	Minimum	Maximum	Mean	Median	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Forecasted earnings	429	36,7800	-10,4800	26,3000	,233846	,200000	2,1628772	4,678
Unexpected earnings	429	54,9000	-30,2000	24,7000	-,002867	,010000	2,6224096	6,877
SUE	429	13,8928	-8,0329	5,8599	-,027663	,022946	1,7841010	3,183
CAR	429	14878,3187	-71,5610	14806,7576	1829,022410	1370,120242	2081,1788668	4331305,475
Valid N (listwise)	429							

The forecasted earnings, unexpected earnings and SUE variables are collected from the 1Q 2009- 3Q 2011. The CAR variable is analysed Q2 2009-Q4 2011.

Table 4.1 presents the data collected. The forecasted earnings, unexpected earnings and the SUE variable are collected from quarterly reports whereas the CAR variable is collected from the stock market in 2009, 2010 and 2011. The location of the data is estimated by the mean and the median in table 4.1. Despite the fact that the mean is more common to use in descriptive statistics, the median is more appropriate when the data is skewed and include extreme values (Anderson et al., 2009). Forecasted earnings provided from the time series model has a mean of 0,2 SEK. The actual EPS minus the forecasted earnings equals the unexpected earnings, which are slightly negative, -0,0028 SEK. The mean of the SUE variable is also somewhat negative, -0,0276 SEK. The low expectations both for the unexpected earnings and the SUE might be due to the time period investigated, since the unstable economy is argued to influence investor behaviour (Kremer et al., 2011). The location of the data might in addition have been different if a more complex time series model were used to estimate the forecasted earnings.

Table 4.1 further present the location of the CAR variable, which is better described with the median since both the range and variance include large values. The median of CAR is 1 370 SEK. The abnormal return equal thereby 1 370 SEK, measured one day after earnings announcements and onwards, until the following earnings announcement day. As can be seen in table 4.1, CAR has the largest variability in the

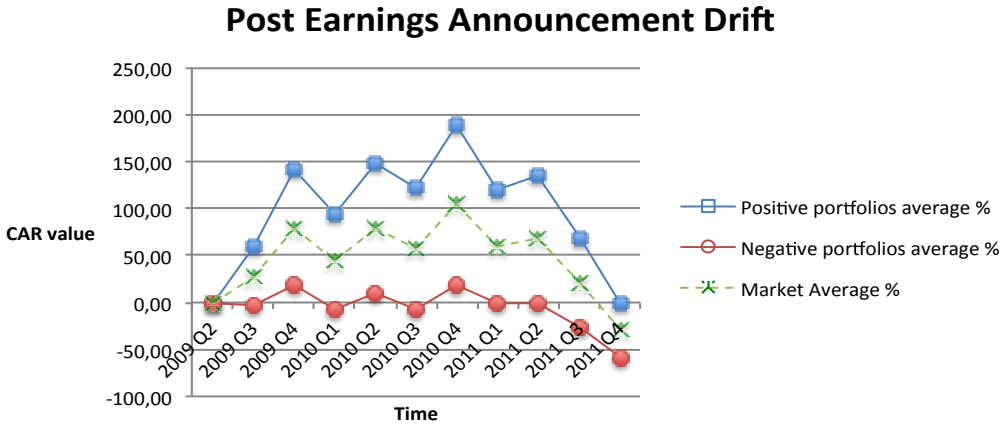
data, which include a large amount of extreme values. The standard deviation show that there is a variability of 2,1628 SEK for the forecasted earnings and a variability of 2,6224 SEK for the unexpected earnings. Lowest variability estimated by the standard deviation has the SUE variable, 1,7841 SEK. As expected, the highest variability of the four variables investigated is CAR, with 2 081 SEK. All measures are accounted in quarters but it should be noted that the CAR value also include stock return every trading day of that quarter. Therefore the CAR measure is allowed to vary to a larger extent. The abnormal return should furthermore be lower for firms, which have low SUE, and higher when SUE is high, which implies that a large variability in CAR is needed. The variability of the SUE variable is, however, quite low. This indicates that the PEAD will not be pronounced. Next, the buy and hold abnormal return will be used on the CAR data in order to express the PEAD graphically.

4.2 Findings

Figure 4.1 show the PEAD for the 39 firms investigated in this research. The x-axis in the Figure is the time period, whereas the y-axis is the abnormal return in percentage. The blue square line, presented in Figure 4.1, show the average cumulated abnormal return for the positive SUE portfolios investigated. Investigating two quarters after the earnings announcements, a positive PEAD is found in Q2 2009- Q2 2010. Investigating the drift after one year (four quarters) the positive PEAD can be distinguished in Q2 2009, Q3 2009 and Q1 2010. The positive drift cannot be distinguished for the positive SUE portfolios in 2011.

The red circled line presented in Figure 4.1 represents the average cumulated abnormal return for the negative SUE portfolios. Investigating two quarters after the earnings announcements, a negative PEAD is found in Q3 2009, Q4 2009, Q4 2010, Q1 2011 and Q2 2011. Investing the PEAD after one year, negative PEAD after negative earnings announcements is found in Q3 2009, Q2 2010, Q3 2010 and Q4 2010.

Figure 4.1 Buy and hold abnormal return in percentage



The SUE values estimated in Q1 2009 is investigated in the market the following quarters, Q2 2009- Q4 2011. The CAR values presented in the announcement quarter is excluded from the buy and hold abnormal return measure. The portfolio CAR values are presented in Appendix 6.

Why this PEAD development in the abnormal return is shown in the 39 small cap listed firms, is in line with Foster et al., (1984) and Bernard and Tomas (1989), who argue that there are indications that the PEAD will be found among small listed firms. PEAD equals a positive development in the abnormal return is found in portfolios which present positive SUE and that a negative development in the abnormal return is found in portfolios which presents negative SUE (Ball & Bartov, 1968). Despite the fact that Figure 4.1 does not present the PEAD over the whole sample period, it is still found in some of the quarters investigated.

One explanation to the PEAD presented in Figure 4.1 is that small firms are less transparent and thereby do not include information on future earnings in their stock return (Sadka and Sadka, 2009). The lack of transparency causes information uncertainty, and makes it harder for the investors to reveal the underlying potentials of the firm (Jiang et al., 2005; Vega, 2006; Sadka & Sadka, 2009). Hong and Stein (1999) have a similar view on this matter, and argue that the slow reaction in market prices occurs due to a slow distribution of firm information. The slow reaction is expressed both as a positive and a negative PEAD, investigating the accumulated abnormal return in two and four quarters after earnings announcement in Figure 4.1 above.

Small firms have in addition low institutional ownership and high transaction costs, which implies that they are less frequently traded in comparison to other firms (Ng et al., 2008). Positive unexpected earnings presented by small listed firms might also be due to barrier to arbitrage (Brav et al., 2010), where it is hard to gain money on an imperfect situation since uninformed investors also take part in the trading process (Chordia et al., 2009; Chung & Hrazdil, 2011). This especially provides explanations to why there is a positive drift in the blue-square line in Figure 4.1. Ng et al., (2008) argue on the other hand, that firms with high transaction costs might also result in an upper limit of the share prise, since investors' only trade when they gain to do so (Ng et al., 2008). Less reaction is made from the investors after earnings announcements if they do not gain from the trading. This finding might provide explanations to why there is not only a positive PEAD after positive earnings announcements in Figure 4.1, which is especially the case at the end of the sample period.

The development after earnings announcements in Figure 4.1 can also be due to investor behaviour. Bartov (1992) and Bernard and Thomas (1990) argue the PEAD is due to investors, which fail to the potential in the accounting earnings. Research also finds that the PEAD especially for small, non-dividend-paying stocks is due to investor emotions (Mian & Sankaraguruswamy, 2012). According to Chan et al., (1996) those firms, which present less profitable returns, trigger an extremely pessimistic behaviour, which causes a negative development in the abnormal return. The down turning PEAD after negative earnings announcements, presented in the red circled line in Figure 4.1, is mainly found at the end of the sample period. Investor

conservatism, where the investor relies on past information (Chen, 2012) is another behavioural explanation to the development after negative earnings announcements in Figure 4.1 (Barberis et al., 1998). Further literature, which can be related to the result presented, are the cultural aspects (Chui et al., 2010), where investors in the stable environments are argued to have more biases in their decision-making (Kremer et al., 2011). According to Chui et al., (2010) individualistic countries prioritise private information over public information. This so called self-confidence behaviour causes a larger PEAD in the share prices, resulting in an abnormal return (Daniel et al., 1998). The international study by Griffin et al., (2008) furthermore finds evidence that PEAD varies across countries, which is due to the freedom of press and insider trading. Perhaps this is why there is a drift in the share return not directly but some time after earnings announcements, which is especially true investigating the red circled line in Figure 4.1. On the other hand, Barber et al., (2012) find PEAD in several countries, all around the globe and argue that cultural effects cannot explain PEAD.

Another explanation to the positive and negative drift in the share return is the type of investor, who trade small cap listed shares (Vega, 2006). According to Battalio and Mendenhall (2005) small traders base their decisions on less sophisticated information, which makes individuals to underweight earnings potentials. Ng et al., (2008) argue in addition that there are differences whether the investor is informed or not. A permanent effect is caused in share prices if it is an informed investor trading. Since the informed investor always trade when the person gain to do so, the effect, in terms of drift, becomes stronger. Hong and Stein (1999), argue in contrast that it is the naïve momentum traders who cause the PEAD. Other research argue that individuals cannot create the drift themselves (Hirshleifer et al,. 2008; Jacob et al., 2000). If this were the case, other individuals would try to gain on the imperfect market, and cause the imperfections to disappear (Jacob et al., 2000).

Both Francis et al., (2007) and Jiang et al., (2005) discuss the impact of information uncertainty in relation to PEAD, which also can be connected to the result presented. Francis et al., (2007) argue that the investors go though a learning process after information is released in financial reports, which causes PEAD. On the other hand, Francis et al., argue that the learning effect is due to value relevant information, presented by the firm. The relevant information is not very likely to be provided by small listed firms according to Foster et al., (1984). More likely is that small firms have a lower trading activity, and that they do not provide value relevant information (Foster et al, 1984).

Despite the explanations of market frictions and investor behaviour, which suits quite well to the result presented in Figure 4.1 above, additional explanations concerning the research design will be reflected since research also consider this to be part of the drift explanations (Foster et al., 1984; Taylor & Wong, 2010; Konchitchki et al., 2010). The models used are for example not very complex, rather simplified. As discussed in

the methodology, it can be questioned whether the forecast of EPS is the true forecast, which investors had at that time? The market indices might also be doubtful, since these are based on firm's common equity and not the actual size of the firm. This implies that a firm might have had a larger or smaller abnormal return than presented in Figure 4.1. Also, the buy and hold abnormal return, which is unable to distinguish the effect in the stock return related to earnings news from *other* news, is a limitation. The researcher has, however, applied models from previous research, which has investigated PEAD.

Another reflection is the sample size, where only a few firms from the small cap list are investigated. This has resulted in a small amount of firms in the portfolios investigated, where the firm have a large impact on the portfolio development. Table 4.1 show in addition the variability of the SUE variable to be quite low. The low variability might not have occurred if a larger sample were chosen. Perhaps a more distinguished positive and negative drift would then have occurred. Also, the ranking procedure, where a firm can be included in both a positive and a negative portfolio, is doubtful. As can be seen, the fluctuations are similar comparing the square and the circulated line in Figure 4.1. Even if the fluctuations are on different positions, they mainly fluctuate at the same direction. This might not be the case if firms were either put in positive SUE portfolio or a negative SUE portfolio. Last methodical explanation provided to the result in Figure 4.1, is the short time period investigated. With a longer duration a more distinguished drift, both after positive and negative earnings announcement might have occurred.

Table 4.2 Average SUE and average CAR for each portfolio ranked on SUE (SEK)

Portfolio	SUE average	CAR average
1	2,80	19 168
2	1,25	22 159
3	0,57	17 568
4	0,25	16 820
5	0,11	8 426
6	-0,06	9 354
7	-0,12	11 870
8	-0,63	17 627
9	-1,33	13 857
10	-3,07	17 454

To reach the SUE average, SUE values for 39 firms have been calculated (the actual EPS minus the forecasted EPS divided with a firm specific standard deviation). The SUE values are calculated in 11 quarters for each of the 39 firms, Q1 in 2009 – Q3 in 2011. The firms have then been ranked depending on the size of SUE in each of these quarters. The most positive SUE values are placed in portfolio 1, whereas the most negative SUE values are placed in portfolio 10. Each SUE portfolio consists of four firms, except portfolio 5. Due to the uneven number of analysed firms, portfolio 5 was chosen to include three firms since it is not categorised as an extreme portfolio. To reach the CAR average, the researcher first calculated the CAR values for each firm quarter investigated in this research. Depending on the portfolio formation, based on SUE, quarterly CAR values in Q2 2009 –Q4 2011 where put together using a buy and hold abnormal return model, where the firms where equally weighted. The average CAR is

reached from the average value of each quarter of CAR, and then using the average of the 11 values collected from Q2 2009-Q4 2011.

A detailed view of SUE and CAR for each of the portfolios is summarized in Table 4.2. From Table 4.2, portfolio 1-5 are defined as positive portfolios, and portfolio 6- 10 are defined as negative portfolios, because of the sign of the average SUE value. As can be noted from Table 4.2, the SUE values do not vary that much comparing the ten portfolios. The highest abnormal return is found in the two most positive SUE portfolios, portfolio 1 and portfolio 2. The lowest abnormal return is surprisingly found in portfolio 5 and 6. Portfolio 8 and portfolio 10 which are defined as negative portfolios have similar CAR average as portfolio 3. Since the previous Figure 4.1 presents both a positive and a negative drift after unexpected earnings, the CAR values were expected to look somewhat different. Again, this might be due to the small randomly chosen sample size of the 39 firms investigated.

Table 4.3 Buy and hold abnormal return in percentage for each portfolio

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	Market average
2009 Q2	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2009 Q3	36,99	10,79	242,34	53,33	-49,83	-49,78	11,07	-39,04	7,92	57,85	28,16
2009 Q4	41,66	164,76	487,98	58,57	-50,69	-57,05	1,20	-18,22	94,10	68,22	79,05
2010 Q1	37,04	85,21	387,39	23,05	-57,73	-66,49	-40,48	-19,44	68,91	16,68	43,42
2010 Q2	59,21	95,52	611,35	22,05	-52,45	-60,89	-21,38	25,70	68,25	37,18	78,46
2010 Q3	61,28	94,98	471,22	35,53	-57,38	-62,06	-42,89	-1,00	52,53	16,60	56,88
2010 Q4	104,57	188,73	630,87	54,60	-31,63	-37,32	-31,39	16,70	87,06	55,06	103,72
2011 Q1	51,90	106,65	450,33	42,10	-46,86	-49,98	-48,47	16,43	48,66	28,23	59,90
2011 Q2	60,51	106,61	516,34	33,19	-41,35	-55,65	-50,13	19,67	52,84	33,65	67,57
2011 Q3	5,98	39,03	333,89	11,50	-52,83	-65,53	-64,17	-21,69	30,43	-13,30	20,33
2011 Q4	-36,02	-14,69	152,39	-39,22	-71,40	-80,84	-80,16	-50,07	-33,97	-45,31	-29,93

More specified information on this table is presented in Appendix 6

Table 4.3 show the percentage development in each portfolio, including the market average. The percentage development in portfolio 5 is negative in every quarter, which explains why this portfolio has the lowest number of CAR in table 4.2. Table 4.3 also show an overall positive development in portfolio 9 and 10. This is, however, not in line with previous research, which has found the PEAD to be especially pronounced in extreme SUE portfolios (Baakrishanan et al., 2010; Ng et al., 2010). On the other hand, previous research has included more firms, investigated over a longer duration of years, which have resulted in more extreme values of SUE.

Figure 4.2 Buy and hold abnormal return in percentage for the five positive SUE portfolios

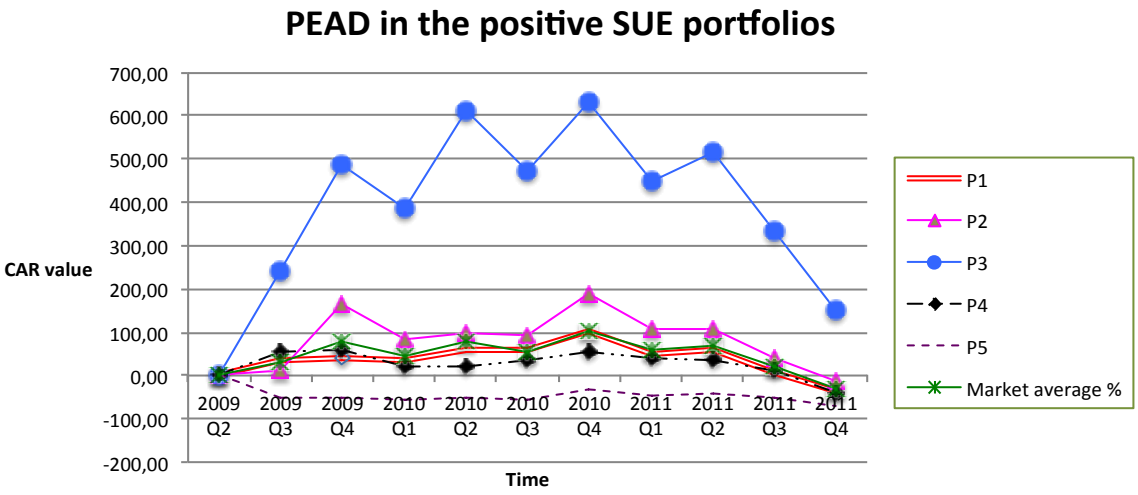
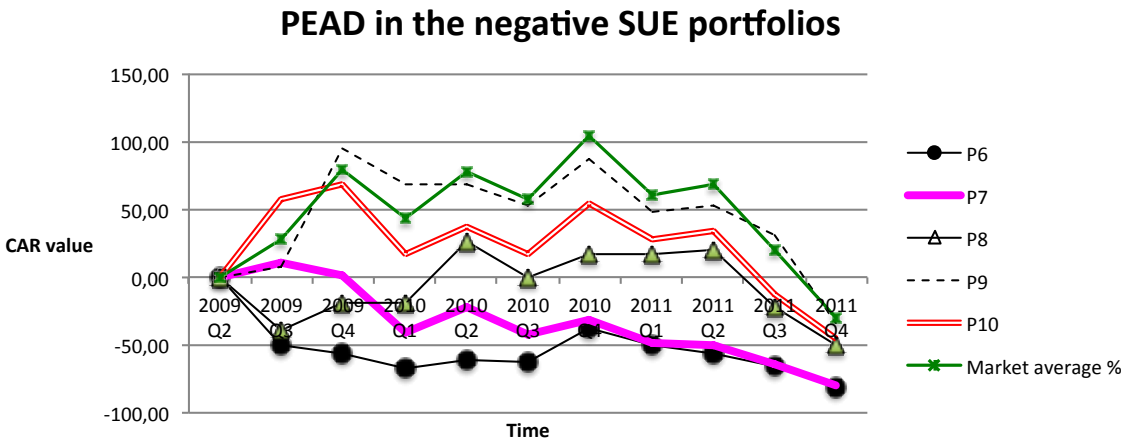


Figure 4.2 present the PEAD separately for the positive SUE portfolios. As noted in the figure, the percentage development of portfolio 3 is far more positive than the other portfolios. Both portfolio 2 and 3 has a constantly higher abnormal return compared to the market average. Since these two portfolios are defined as extreme portfolios, previous research of Baakrishanan et al., (2010) and Ng et al., (2010) argue that the PEAD will be more pronounced. On the other hand is portfolio 1, the most extreme portfolio of SUE values, in this research do not provide as clear drift. Portfolio 5 is furthermore lower compared to the overall market average in abnormal return, and do not behave as a positive portfolio explained by previous research (Setterberg, 2011). Why portfolio 5 presents positive unexpected earnings but do not present a positive PEAD in the share return, might be due to the lower amount of firms included in the portfolio. Another explanation is that the average SUE value is close to zero (0,11) and is not an extreme portfolio. As discussed, the small sample investigated might be part in the explanation to the reaction in the abnormal return after positive earnings announcements. The PEAD might be more pronounced if a larger sample is analysed.

Figure 4.3 present the PEAD separately for the negative SUE portfolios investigated. As can be seen from Figure 4.3, portfolio 9 and 8 present less negative drift in the share return after negative earnings announcements. This is again inconsistent with Baakrishanan et al., (2010) and Ng et al., (2010) who argue that the PEAD will be more pronounced in the extreme SUE portfolios. In contrast, the negative drift seems to be quite pronounced in portfolio 6 and 7. Comparing Figure 4.2 with Figure 4.3, the percentage development in six out of the ten portfolios is quite similar. Again, it is possible that the ranking procedure, where a both positive and negative SUE value of the same firms is cumulated, have effected the result.

Figure 4.3 Buy and hold abnormal return in percentage for the five negative SUE portfolios



4.3 Discussion

The aim of this paper is to analyse how pronounced the PEAD is in the small cap listed firms. Part of the findings in this paper indicates the existence of PEAD in the 39 small cap listed firms. There are several behavioural explanations to why the PEAD is found both after positive and negative unexpected earnings, which has been reflected in this chapter. Also market frictions are argued to cause the drift, either as barriers to arbitrage or in terms of transaction costs. The PEAD is, however, not found in all quarters investigated. One might therefore question how this can be the case. Therefore, the different findings of the paper will be discussed and reflected in further detail. Referring to Taylor and Wong (2010), the efficiency and the inefficiency of the capital market is not an easy question, and cannot be provided with a simple answer. Investigating the result of this paper, one can certainly agree on that. According to Taylor and Wong the occurrence of the capital market depends on many different aspects taken together, which is discussed below.

Why this result is found can be connected to the institutional theory, where institutions and unwritten rules are argued to vary across cultures and countries (Powell and DiMaggio, 1983). Different cultures are furthermore argued to result in the investment decisions (Kremer et al., 2011). The institutional theory might therefore provide explanations to why a less pronounced drift is found, compared to the research by Bernard and Thomas (1989) and Foster et al., (1984) who investigate the US stock market and small listed firms. Despite the fact that PEAD is found outside the US stock market too, for example in the UK (Hew et al., 1996; Liu et al., 2003), Finland (Booth et al., 1996) and the large cap list in Sweden (Setterberg, 2011), this paper is not able to estimate a pronounced PEAD over the whole sample period investigated. Previous research has in addition found PEAD internationally, investigating a range of countries (Griffin et al., 2008; Barber et al., 2012) where Barber et al., find the most pronounced drift in small listed firms. None of the research does, however, exclusively investigate Swedish small cap listed firms. This

strengthens the institutional explanations to why the PEAD is not found in all the quarters investigated. Worth noticing is, however, that small firms are argued to have less institutional ownership in general (Bhushan, 1994; Ng et al., 2008).

Perhaps a stronger PEAD would be found if larger firms were analysed, using other lists on the NASDAQ OMX Nordic Stockholm. Larger firms are for example argued to be more transparent and provide more value relevant information to the investor (Francis et al., 2007). A larger firm would in addition have higher trading activities, which also is argued to cause PEAD (Chui et al., 2010) On the other hand, there are also researches that express the opposite, namely that high transaction cost results in a high PEAD (Bhushan, 1994). Hew et al., (1996) find in addition the PEAD to be statistically significant in small listed firms and not for large firms at all. The time span and stock exchange of this study is, however, different compared to Hew et al., (1996). Despite the fact that this paper includes previous research written in 2010, 2011 and 2012, none of these has investigated the stock market after the financial crises in 2008. The downturn in the world economy, which can be argued to effect the stock market, should not be neglected in the discussion of the result of this paper. In fact, the time period chosen is very important investigating the outcome of the research (Foster et al., 1984).

Additional reflections from the findings are related to the methodology. If there are biases in the forecasted earnings, for example, there are also specification errors in the SUE values (Chan et al., 1996). The market indices applied from previous research might in addition cause errors in the CAR values (Börjesson & Johansson, 2012). On the other hand, previous research has came to the same conclusions despite using a more simplified time series model (Foster et al., 1984). The researcher argue in addition that there is little argument for errors in the CAR values since the research use the consolidated financial statement and has accounted for the quotient value when it comes to A- and B shares. The research does in addition not include either investment or holding firms.

Due to the time limit, and time-consuming process of collecting the data needed, this research is performed and chosen not to include more than 39 firms. It is, however, possible that a larger sample might have enabled more extreme SUE values, and thereby a larger PEAD in both the positive and negative portfolios. The variability among the SUE values in this particular research is very small, which might be due to the random selection of firms. Investigating 39 firms in a few quarters is, in addition quite different to the previous research presented in the literature review.

To sum up, this paper has distinguished both a positive and a negative PEAD in the abnormal return investigating 39 small cap listed firms in 2009, 2010 and 2011. The drift is found both two quarters after earnings announcements and four quarters after the earnings announcements. The result of this paper in addition showed a

negative drift in the share return after positive earnings announcement at the end of the sample period and some negative earnings announcements to drift upwards after negative unexpected earnings. Both market frictions and investor behaviour are reflected in the result as well as methodological considerations. The size of the random sample is discussed to be part of the explanation to the low variability in the SUE variable and thus the less pronounced PEAD in the extreme portfolios examined in this study. Also, the specific time period investigated may be due to the result of this paper.

5. Conclusion and further research

This section concludes the results of this paper and elaborates upon the findings from previous research. The very last part of this section includes subjects left for further research.

5.1 Conclusion

Questioning how pronounced the PEAD is in small cap listed firms on NASDAQ OMX Nordic Stockholm, the answer is not straightforward. This paper find a pronounced PEAD in some of the time period, which means that the capital market is not efficient since abnormalities are found among the investigated small cap listed firms. But the paper is at the same time unable to distinguish a pronounced PEAD in the whole time period investigated.

The aim of this study is to investigate the market expectations of quarterly EPS for small listed firms, and to examine to what extent the share price is effected of these expectations. Investigating 39 small cap listed firms on the NASDAQ OMX Nordic Stockholm, show a positive abnormal return in the capital market after positive earnings announcement and a negative abnormal return after negative earnings announcements. According to the result, the PEAD is estimated both as a positive and negative PEAD after two and four quarters after earnings announcements in 2009, 2010 and 2011, with some exceptions. Some of the quarters investigated are unable to reveal the PEAD. At the end of the sample period the positive unexpected earnings showed for example a negative drift in the share prices. This research presents thereby both a positive and negative PEAD in the small cap listed firms on NASDAQ OMX Nordic Stockholm investigated, but also a less pronounced drift both for the positive and negative unexpected earnings.

PEAD is argued to be due to market frictions and behavioural biases. There are both behavioural explanations, which argue the public and private information to matters when determining the PEAD (Daniel et al., 1998; Chui et al., 2010), whereas other behavioural paper finds the type of investor to matter (Vega, 2006). Hong and Stein (1999), argue the naïve momentum trader cause the drift whereas Ng (2008) states the informed investor to be the cause for PEAD. Other researchers argue in contrast that individuals themselves are unable to cause PEAD (Jacob et al., 2000; Hirshleifer et al,. 2008). The market friction explanations of PEAD are also somewhat mixed. Ng et al., (2008) are able to explain the existence as well as the persistence in PEAD due to high transaction costs. The transaction cost explanation to PEAD is in addition the opposite of Chui et al., (2010) who state that high trading activity cause the PEAD, not high transaction costs.

Despite the different explanations toward the PEAD, previous research finds PEAD among small listed firms (Foster et al., 1984; Bernard & Thomas, 1989; Hew et al.,

1996; Barber et al., 2012). With low analyst following as well as institutional attention, small firms seem to have a pronounced PEAD (Livnat & Mendenhall, 2006). PEAD is found in stock markets outside the US (Booth et al, 1996; Liu et al., 2003; Griffin et al., 2008) and also within the Swedish stock exchange (Setterberg, 2011). None of the articles has however analysed the years after the financial crises, which can be due to why this research partly is unable to find a pronounced PEAD. There is, however, additional research that is unable to relate PEAD to firm size (Liu et al., 2003), and none of the articles exclusively investigate the small cap list on NASDAQ OMX Nordic Stockholm, which makes these findings somewhat hard to compare.

The result also expresses a negative PEAD after positive earnings announcements as well as a positive PEAD after negative earnings announcement, which is quite the opposite of the PEAD research. There are, however, no consensus conclusions on the PEAD today (Lo, 2007), and the market inefficiency is argued to depend on several aspects (Taylor & Wong, 2010). The sample size, the time period and methodological aspects in general must therefore be reflected with careful consideration since it can be part of the explanation to why this result is found in the first place. Also, the volatility in share prices, which is measured in the abnormal return, can be due to other things than earnings news, which has not been taken into consideration in this paper. Besides, having a short time period of a few years, the global economy as such might as well have resulted in these findings. No such research is, however, found in order to compare the result.

5.2 Contribution

This paper contributes to the PEAD research (especially Foster et al., 1984; Bernard & Thomas, 1989; Hew et al., 1996; Setterberg, 2011; Barber et al., 2012), applied in a Swedish setting and on small listed firms. As shown in the result, there is a PEAD in both positive unexpected earnings as well as negative unexpected earnings, which is an important and valuable finding examining the efficient market hypothesis. According to the result, the market cannot be seen as perfect, since there is a drift after two as well as four quarters after earnings announcements part of the time period investigated. Knowing that positive unexpected earnings lead to an increased abnormal return and vice versa, investors and analysts can take advantage and easier predict the future return generated from the capital market. The result is important for market actors, since this research contributes in knowledge about the relation between quarterly EPS and the abnormal return. The result further suggests that market prices do not reflect the financial information perfectly, which implies that market actors such as accountants must act with more prudence.

Investigating the result it is clear that investors have a delayed reaction when it comes to the accounting information presented in quarterly reports of small cap

listed firms. The actual reaction is in fact shown after two and four quarters after earnings announcements. This finding is quite interesting, since Ball and Brown (1968) found the PEAD in the 1960's, where the trading activities of shares were completely different. One could have assumed that the improved technology of trading shares would have effected the PEAD. This paper is, however, unable to distinguish the drift during the whole period investigated.

This study is furthermore investigated after the IFRS harmonization project. The harmonisation of accounting standards, which must be followed by all listed firms within the EU, might result in an increased cross-boarder trading and hence cause a larger PEAD. Since the PEAD is not as in pronounced as previous research (Booth et al., 1996; Hew et al., 1996 and Setterberg, 2011) there might be institutional factors, when it comes to the small listed Swedish firms, which set the rules. Most of the research investigated in this paper is furthermore applied in small listed firms in the US stock market. There might be huge differences in institutional norms comparing different stock markets, which in addition have different definitions of the size of a small listed firm. Small listed firms are however used in the research by Hew et al., (1996) in the UK and by the previously released paper by Barber et al., (2012) who analyse countries all over the world and find the PEAD to be more pronounced in small listed firms. None of the research investigates, however, the Swedish small cap firms exclusively.

5.3 Further research

Further contribution of the small cap firms listed on NASDAQ OMX Nordic Stockholm would be to investigate the total amount of the 130 firms. Analysing the whole small cap list instead of a random sample, would gain several advantages. The portfolio formation would, most likely be able to separate between the firms with positive earnings announcements, and those with negative earnings announcements. The variability among the SUE values would be larger, and hopefully enable the researcher to distinguish a more pronounced PEAD in the share return. It would, in addition, be interesting to analyse small listed firms in a time span similar to previous research, in order to compare the result and findings with the same economic situation. A further suggestion is to strengthen the methodological aspects in terms of develop the time series model in order to reduce poetical specification errors.

Investigating the PEAD in Sweden is a rather time consuming process. Since there is no database just yet, which provide quarterly firm information when it comes to small cap listed firms, much of the financial data has to be collected manually. A more comprehensive research including statistical tests would enable a deepened discussion of the efficient market hypothesis, and contribute to the PEAD outside the US market.

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Appendices

Appendix 1 Firms investigated

Acando B
Anoto Group
Artimplant B
Beijer Elecectronics
BioInvent International
Björn Borg
Concordia Maritime B
Consilium B
Cybercom Group
Elos B
Enea
Feelgood Svenska
Geveko B
Image Systems
ITAB Shop Concept B
Karo Bio
Know IT
Lammhults Design Group B
Malmbergs Elektriska B
Micronic Mydata AB
Midsona B
MultiQ International
NOVOTEK B
Opcon
Ortivus A
PA Resources
Phonera
Precise Biometrics
Pricer B
Probi
RaySearch Laboratories B
Rederi AB Transatlantic
Rörvik Timber B
Semcon
SinterCast
Svedbergs B
TradeDoubler
Uniflex B
Vitrolife

Appendix 2 Sample mean of EPS (SEK)

	2006 Q4	*2007 Q1*	*2007 Q2*	*2007 Q3*	*2007 Q4*	*2008 Q1*	*2008 Q2*	*2008 Q3*	*2008 Q4*
Acando B	0,5	0,38	0,27	0,24	0,44	0,67	0,5	0,38	0,67
Anoto Group	-0,31	0,07	-0,1	-0,01	-0,02	-0,1	-0,11	0	-0,16
Artimplant B	-0,16	-0,05	-0,08	-0,06	-0,04	-0,1	-0,1	-0,07	-0,1
Beijer Elecectronics	7,91	2,55	4,68	1,67	2,86	2,14	5,26	2,65	3,81
BioInvent International	-0,53	1,54	-0,68	-0,34	-0,68	-0,72	2,4	-0,58	-0,82
Björn Borg	1,05	0,96	0,57	1,42	1,22	1,07	0,48	1,5	0,91
Concordia Maritime B	1,09	0,11	0,47	0,66	1,32	0,43	0,82	1,17	2,01
Consilium B	1,96	1,05	1,96	2,64	3,5	1,1	2,06	2,79	2,6
Cybercom Group	2,86	1,07	0,84	0,99	4,46	1,17	1,02	0,72	2,36
Elos B	0,62	0,77	0,97	1,27	4,2	1,16	1,08	0,84	1,54
Enea	0,04	0,04	0,53	0,63	0,1	0,03	1,74	0,79	1,76
Feelgood Svenska	0,15	0,07	0,1	0	0,14	0,06	0,07	0,01	0,12
Geveko B	8,5	-5,65	10,75	5,6	-10,45	-17,7	1,95	3,1	-5,05
Image Systems	-0,63	0,03	0,1	0,1	0,05	-0,28	-0,47	-1,17	-0,12
ITAB Shop Concept B	10,31	2,95	2,86	4,26	2,49	0,76	2,86	4,7	2,58
Karo Bio	-0,58	-0,56	-0,67	-0,26	-0,47	-0,45	-0,43	-0,36	-0,25
Know IT	1,4	1,61	1,28	0,8	1,57	2	4,07	0,82	2,3
Lammhults Design Group B	1,91	1,53	0,51	2,19	0,75	1,54	1,22	2,07	1,4
Malmbergs Elektriska B	2,44	1,42	0,4	1,48	1,82	1,37	0,59	1,2	4,25
Micronic Mydata AB	0,24	-1,98	-1,93	-0,62	-0,77	-0,75	-1,55	-0,64	2,16
Midsona B	-0,68	0,27	-0,29	-0,19	-5,63	0,2	0,07	-0,05	0,1
MultiQ International	0,12	0,02	-0,09	-0,07	0,11	-0,04	0,11	0,02	0,17
NOVOTEK B	1,41	0,39	0,3	0,47	1,2	0,17	0,45	0,58	0,99
Opcon	3,65	0,39	0,02	0,52	0,68	-0,07	0	-0,01	0,27
Ortivus A	-8,51	-0,54	-0,62	-0,55	-2,96	-0,53	-2,04	-0,18	-1,11
PA Resources	0,61	0,28	2,17	2,29	1,8	1,61	1,7	0,4	2,66
Phonera	0,01	0,04	0,05	0,05	0,02	0,04	0,06	0,07	-0,07
Precise Biometrics	-0,74	-0,1	-0,09	-0,26	-0,1	-0,11	-0,08	-0,18	-0,35
Pricer B	-0,05	0	-0,01	-0,01	0	0	0,01	0,03	0,11
Probi	0,03	0,11	0,09	0,31	2,11	0,14	0,3	0,51	0,15
RaySearch Laboratories B	1,73	0,46	0,16	0,18	0,09	0,27	0,03	0,09	0,32
Rederi AB Transatlantic	1,9	2,2	1,2	2,1	1	2,6	1,7	3	2,2
Rörvik Timber B	0,36	3,78	8,3	2,66	1,3	-0,9	-3,72	-4,33	-7,14
Semcon	0,13	1,62	-0,19	0,68	10,3	2,59	2,6	1,45	-1,45
SinterCast	-0,4	-0,2	-0,1	-0,3	-0,1	3,4	-0,1	-0,1	-0,9
Svedbergs B	1,08	0,97	1,09	0,98	0,91	0,87	1,03	0,73	0,74
TradeDoubler	1,68	0,98	1,09	1,74	1,54	1,36	0,6	1,21	1,54
Uniflex B	1,41	0,73	1,12	3,33	2,97	3,3	3,85	3,09	1,18
Vitrolife	0,11	0,55	1,04	1,42	0,4	0,41	0,71	1,01	0,51
Sum	42,62	19,86	38,07	38,01	28,13	8,71	30,74	27,26	21,89
Avegare	0,80	0,37	0,72	0,72	0,53	0,16	0,58	0,51	0,41
Sample mean									0,54

Appendix 3 Portfolio formation

2009 Q1		P	2009 Q2		P	2009 Q3		P	2009 Q4		P
Consilium B	-8,03	10	Lammhults Design Group B	-4,20	10	TradeDoubler	-6,56	10	SinterCast	-3,54	10
Elos B	-7,47	10	Björn Borg	-2,44	10	Concordia Maritime B	-4,22	10	Midsona B	-3,51	10
Cybercom Group	-4,99	10	Rörvik Timber B	-2,19	10	Micronic Mydata AB	-3,60	10	Geveko B	-3,09	10
Enea	-4,94	10	Beijer Elecectronics	-1,62	10	NOVOTEK B	-3,00	10	Semcon	-2,32	10
PA Resources	-4,26	9	Semcon	-0,84	9	Probi	-2,19	9	Micronic Mydata AB	-2,20	9
Micronic Mydata AB	-4,18	9	Midsona B	-0,57	9	Know IT	-1,41	9	Björn Borg	-1,99	9
NOVOTEK B	-3,95	9	BioInvent International	-0,53	9	Acando B	-0,90	9	Rederi AB Transatlantic	-0,63	9
Concordia Maritime B	-2,98	9	Vitrolife	-0,35	9	Geveko B	-0,89	9	Probi	-0,57	9
SinterCast	-2,83	8	RaySearch Laboratories B	-0,27	8	Elos B	-0,67	8	Rörvik Timber B	-0,33	8
Malmbergs Elektriska B	-2,32	8	Acando B	-0,25	8	RaySearch Laboratories B	-0,63	8	PA Resources	-0,19	8
Phonera	-2,29	8	Precise Biometrics	-0,19	8	Svedbergs B	-0,39	8	Beijer Elecectronics	-0,14	8
Acando B	-1,95	8	Anoto Group	-0,12	8	Anoto Group	-0,22	8	Karo Bio	-0,09	8
Beijer Elecectronics	-1,67	7	Opcon	-0,08	7	PA Resources	-0,22	7	BioInvent International	-0,08	7
Geveko B	-1,05	7	Malmbergs Elektriska B	-0,03	7	Rederi AB Transatlantic	-0,18	7	Lammhults Design Group B	-0,04	7
ITAB Shop Concept B	-0,99	7	Uniflex B	-0,01	7	Ortivus A	-0,16	7	Artimplant B	-0,03	7
Lammhults Design Group B	-0,98	7	MultiQ International	0,00	7	Phonera	-0,13	7	Phonera	0,00	7
Rederi AB Transatlantic	-0,91	6	Pricer B	0,00	6	Precise Biometrics	-0,09	6	Svedbergs B	0,00	6
Uniflex B	-0,82	6	Image Systems	0,03	6	Vitrolife	-0,07	6	Image Systems	0,01	6
TradeDoubler	-0,66	6	Artimplant B	0,03	6	Pricer B	-0,04	6	Pricer B	0,07	6
Vitrolife	-0,57	6	Ortivus A	0,07	6	Artimplant B	-0,03	6	Feelgood Svenska	0,16	6
Feelgood Svenska	-0,54	5	Feelgood Svenska	0,13	5	MultiQ International	0,03	5	Cybercom Group	0,18	5
Svedbergs B	-0,50	5	Karo Bio	0,16	5	Image Systems	0,04	5	MultiQ International	0,20	5
RaySearch Laboratories B	-0,49	5	Rederi AB Transatlantic	0,27	5	Karo Bio	0,05	5	Anoto Group	0,34	5
Know IT	-0,48	4	Cybercom Group	0,28	4	Feelgood Svenska	0,06	4	Precise Biometrics	0,44	4
Opcon	-0,48	4	TradeDoubler	0,40	4	Malmbergs Elektriska B	0,07	4	Enea	0,50	4
MultiQ International	-0,46	4	NOVOTEK B	0,50	4	BioInvent International	0,30	4	Know IT	0,68	4
Pricer B	-0,35	4	ITAB Shop Concept B	0,68	4	Uniflex B	0,33	4	Ortivus A	0,69	4
Karo Bio	-0,25	3	Concordia Maritime B	0,73	3	Enea	0,39	3	Malmbergs Elektriska B	0,83	3
Semcon	-0,22	3	Svedbergs B	0,85	3	Opcon	0,58	3	Elos B	0,85	3
Artimplant B	0,06	3	PA Resources	0,93	3	Semcon	0,62	3	ITAB Shop Concept B	0,91	3
Image Systems	0,10	3	Know IT	1,09	3	Consilium B	0,79	3	Concordia Maritime B	0,94	3
Midsona B	0,12	2	Elos B	1,34	2	ITAB Shop Concept B	0,92	2	Opcon	1,00	2
BioInvent International	0,31	2	Consilium B	1,80	2	Beijer Elecectronics	1,75	2	Acando B	1,05	2
Anoto Group	0,36	2	Probi	2,19	2	SinterCast	2,48	2	Consilium B	1,14	2
Probi	0,57	2	Enea	2,63	2	Björn Borg	2,59	2	Vitrolife	1,34	2
Rörvik Timber B	0,68	1	Phonera	3,85	1	Rörvik Timber B	3,56	1	Uniflex B	1,34	1
Björn Borg	0,72	1	Micronic Mydata AB	4,59	1	Cybercom Group	3,85	1	NOVOTEK B	2,00	1
Precise Biometrics	1,01	1	Geveko B	4,92	1	Midsona B	4,12	1	RaySearch Laboratories B	2,24	1
Ortivus A	1,11	1	SinterCast	5,13	1	Lammhults Design Group B	5,64	1	TradeDoubler	5,86	1

2010 Q1		P	2010 Q2		P	2010 Q3		P	2010 Q4		P
Image Systems	-4,16	10	Midsona B	-4,47	10	Micronic Mydata AB	-1,87	10	Rederi AB Transatlantic	-6,84	10
Consilium B	-3,45	10	Björn Borg	-1,81	10	Feelgood Svenska	-1,61	10	Uniflex B	-4,75	10
Lammhults Design Group B	-2,75	10	Opcon	-0,71	10	Elos B	-1,52	10	Lammhults Design Group B	-4,25	10
ITAB Shop Concept B	-2,71	10	Semcon	-0,63	10	RaySearch Laboratories B	-1,17	10	Vitrolife	-4,17	10
Opcon	-1,52	9	Malmbergs Elektriska B	-0,49	9	Svedbergs B	-0,88	9	Opcon	-4,15	9
Malmbergs Elektriska B	-1,42	9	Acando B	-0,40	9	MultiQ International	-0,43	9	Probi	-3,25	9
RaySearch Laboratories B	-1,21	9	Lammhults Design Group B	-0,38	9	Enea	-0,33	9	Geveko B	-2,70	9
PA Resources	-0,69	9	Anoto Group	-0,32	9	TradeDoubler	-0,26	9	Björn Borg	-2,29	9
Geveko B	-0,68	8	Probi	-0,21	8	Acando B	-0,25	8	Beijer Elecectronics	-2,05	8
Uniflex B	-0,59	8	Vitrolife	-0,14	8	Rörvik Timber B	-0,22	8	Know IT	-1,41	8
MultiQ International	-0,55	8	Precise Biometrics	-0,13	8	Pricer B	-0,11	8	Elos B	-1,34	8
Enea	-0,55	8	Ortivus A	-0,05	8	Ortivus A	-0,09	8	PA Resources	-0,62	8
Ortivus A	-0,46	7	Cybercom Group	-0,05	7	BioInvent International	-0,06	7	BioInvent International	-0,44	7
Vitrolife	-0,42	7	Artimplant B	0,00	7	Artimplant B	-0,03	7	MultiQ International	-0,43	7
Svedbergs B	-0,42	7	Karo Bio	0,02	7	Anoto Group	0,00	7	Midsona B	-0,21	7
Know IT	-0,42	7	MultiQ International	0,03	7	NOVOTEK B	0,00	7	Image Systems	-0,04	7
Acando B	-0,30	6	Pricer B	0,07	6	Precise Biometrics	0,00	6	Rörvik Timber B	-0,01	6
Cybercom Group	-0,27	6	Phonera	0,12	6	SinterCast	0,00	6	Svedbergs B	0,00	6
Midsona B	-0,26	6	RaySearch Laboratories B	0,13	6	Beijer Elecectronics	0,03	6	Precise Biometrics	0,03	6
Anoto Group	-0,16	6	PA Resources	0,14	6	Karo Bio	0,07	6	Karo Bio	0,05	6
Feelgood Svenska	-0,16	5	Feelgood Svenska	0,22	5	ITAB Shop Concept B	0,09	5	Cybercom Group	0,05	5
Precise Biometrics	-0,06	5	Elos B	0,22	5	Cybercom Group	0,24	5	Artimplant B	0,06	5
TradeDoubler	-0,06	5	Rörvik Timber B	0,24	5	Malmbergs Elektriska B	0,28	5	Pricer B	0,07	5
Pricer B	-0,04	4	ITAB Shop Concept B	0,34	4	Phonera	0,41	4	Enea	0,08	4
NOVOTEK B	0,00	4	TradeDoubler	0,39	4	Vitrolife	0,50	4	TradeDoubler	0,15	4
Artimplant B	0,03	4	BioInvent International	0,44	4	Concordia Maritime B	0,55	4	ITAB Shop Concept B	0,17	4
Phonera	0,07	4	Svedbergs B	0,50	4	Semcon	0,66	4	Anoto Group	0,22	4
Karo Bio	0,11	3	NOVOTEK B	0,50	3	Consilium B	0,66	3	Consilium B	0,32	3
BioInvent International	0,27	3	SinterCast	0,53	3	Image Systems	0,89	3	Ortivus A	0,53	3
Beijer Elecectronics	0,50	3	Enea	0,53	3	Know IT	0,89	3	Concordia Maritime B	0,58	3
SinterCast	0,71	3	Rederi AB Transatlantic	0,59	3	PA Resources	0,93	3	Semcon	1,16	3
Rederi AB Transatlantic	0,72	2	Concordia Maritime B	0,66	2	Geveko B	1,38	2	Malmbergs Elektriska B	1,32	2
Probi	0,78	2	Know IT	0,95	2	Uniflex B	2,21	2	SinterCast	1,41	2
Micronic Mydata AB	1,29	2	Beijer Elecectronics	1,01	2	Lammhults Design Group B	2,97	2	RaySearch Laboratories B	1,43	2
Rörvik Timber B	1,46	2	Consilium B	1,42	2	Björn Borg	3,11	2	Feelgood Svenska	1,61	2
Björn Borg	1,48	1	Uniflex B	2,00	1	Probi	3,47	1	Acando B	1,75	1
Elos B	3,04	1	Micronic Mydata AB	2,10	1	Opcon	4,71	1	NOVOTEK B	2,50	1
Concordia Maritime B	3,25	1	Geveko B	2,12	1	Midsona B	5,06	1	Phonera	2,55	1
Semcon	3,69	1	Image Systems	3,24	1	Rederi AB Transatlantic	5,59	1	Micronic Mydata AB	2,61	1

2011 Q1			2011 Q2			2011 Q3		
		Portflio			Portflio			Portflio
NOVOTEK B	-2,50	10	Acando B	-0,45	10	Enea	-4,88	10
Opcon	-2,11	10	Anoto Group	-0,18	10	Anoto Group	-3,42	10
Phonera	-2,09	10	Artimplant B	-0,03	10	Acando B	-1,30	10
SinterCast	-1,94	10	Beijer Elecectronics	-2,66	10	SinterCast	-1,06	10
Concordia Maritime B	-1,85	9	BioInvent International	-2,30	9	Feelgood Svenska	-0,82	9
Micronic Mydata AB	-1,74	9	Björn Borg	-1,69	9	Rederi AB Transatlantic	-0,36	9
Consilium B	-1,39	9	Concordia Maritime B	0,55	9	Probi	-0,28	9
Image Systems	-1,29	9	Consilium B	2,09	9	Image Systems	-0,21	9
RaySearch Laboratories B	-1,26	8	Cybercom Group	-1,88	8	Geveko B	-0,15	8
Acando B	-0,55	8	Elos B	-0,36	8	Vitrolife	-0,14	8
ITAB Shop Concept B	-0,37	8	Enea	-0,89	8	Beijer Elecectronics	-0,09	8
Malmbergs Elektriska B	-0,36	8	Feelgood Svenska	0,25	8	Micronic Mydata AB	-0,02	8
Uniflex B	-0,34	7	Geveko B	2,10	7	TradeDoubler	0,00	7
Cybercom Group	-0,29	7	Image Systems	1,39	7	Rörvik Timber B	0,05	7
Feelgood Svenska	-0,09	7	ITAB Shop Concept B	0,42	7	Artimplant B	0,06	7
Pricer B	-0,07	7	Karo Bio	-0,18	7	Precise Biometrics	0,09	7
Ortivus A	-0,05	6	Know IT	0,94	6	PA Resources	0,11	6
Midsona B	-0,05	6	Lammhults Design Group B	-1,16	6	Karo Bio	0,16	6
TradeDoubler	-0,02	6	Malmbergs Elektriska B	0,53	6	Opcon	0,23	6
Rörvik Timber B	-0,01	6	Micronic Mydata AB	-0,55	6	Ortivus A	0,26	6
Artimplant B	0,12	5	Midsona B	-0,02	5	Pricer B	0,32	5
Know IT	0,14	5	MultiQ International	0,03	5	Phonera	0,35	5
Karo Bio	0,18	5	NOVOTEK B	1,00	5	Midsona B	0,37	5
Anoto Group	0,24	4	Opcon	1,15	4	MultiQ International	0,43	4
Semcon	0,24	4	Ortivus A	-0,60	4	NOVOTEK B	0,50	4
Enea	0,30	4	PA Resources	-0,47	4	BioInvent International	0,59	4
Precise Biometrics	0,32	4	Phonera	0,18	4	Concordia Maritime B	0,63	4
Geveko B	0,41	3	Precise Biometrics	-0,41	3	Know IT	0,76	3
PA Resources	0,43	3	Pricer B	0,53	3	Uniflex B	0,93	3
Björn Borg	0,57	3	Probi	-0,14	3	Semcon	1,15	3
Svedbergs B	0,81	3	RaySearch Laboratories B	-0,22	3	RaySearch Laboratories B	1,17	3
MultiQ International	0,87	2	Rederi AB Transatlantic	-0,43	2	Malmbergs Elektriska B	1,33	2
Lammhults Design Group B	1,03	2	Rörvik Timber B	-0,03	2	ITAB Shop Concept B	1,35	2
Rederi AB Transatlantic	1,11	2	Semcon	-1,68	2	Consilium B	1,61	2
Elos B	1,52	2	SinterCast	1,24	2	Svedbergs B	1,63	2
Probi	2,05	1	Svedbergs B	2,51	1	Cybercom Group	1,87	1
BioInvent International	2,59	1	TradeDoubler	0,03	1	Lammhults Design Group B	2,10	1
Beijer Elecectronics	2,73	1	Uniflex B	-0,12	1	Björn Borg	2,17	1
Vitrolife	3,47	1	Vitrolife	0,42	1	Elos B	3,71	1

Appendix 4 Common Equity (TSEK)

Firm	Common equity			TSEK
	2009	2010	2011	Average
Acando B	993 58	99555	99555	99489
Anoto Group	2572	2572	2606	2583
Artimplant B	5865	11791	11791	9816
Beijer Elecectronics	6222	6222	6311	6252
BioInvent International	27830	30558	33603	30664
Björn Borg	7859	7859	7859	7859
Concordia Maritime B	349840	349840	349840	349840
Consilium B	53974	53974	53974	53974
Cybercom Group	11400	11400	11400	11400
Elos B	30945	30945	30945	30945
Enea	18365	18365	18356	18362
Feelgood Svenska	129925	129925	129925	129925
Geveko B	87488	167677	167977	141047
Image Systems	9900	64800	9900	28200
ITAB Shop Concept B	25965	25965	25965	25965
Karo Bio	77000	193500	193500	154667
Know IT	14923	17124	17324	16457
Lammhults Design Group B	84481	84481	84481	84481
Malmbergs Elektriska B	18000	18000	18000	18000
Micronic Mydata AB	65278	97917	97917	87037
Midsona B	445712	447297	447297	446769
MultiQ International	28584	28584	28584	28584
NOVOTEK B	2275	2275	2275	2275
Opcon	122660	125796	260342	169599
Ortivus A	5500	5500	5500	5500
PA Resources	74651	3022801	318738	1138730
Phonera	15978	15978	15978	15978
Precise Biometrics	53984	53984	75578	61182
Pricer B	101387	105326	108239	104984
Probi	46826	46826	46826	46826
RaySearch Laboratories B	10948	10948	11479	11125
Rederi AB Transatlantic	284305	554514	1109027	649282
Rörvik Timber B	120245	311444	311449	247713
Semcon	18100	18100	18100	18100
SinterCast	6500	7000	7000	6833
Svedbergs B	24910	24910	24910	24910
TradeDoubler	11400	17123	17123	15215
Uniflex B	2583	2596	13338	6172
Vitrolife	19944	19944	19954	19947

Appendix 5 Equity group (TSEK)

Group 1	
Anoto Group	2583
NOVOTEK B	2275
Ortivus A	5500
Group 2	
Beijer Elecectronics	6252
Björn Borg	7859
SinterCast	6833
Uniflex B	6172
Group 3	
Artimplant B	9816
Cybercom Group	11400
RaySearch Laboratories B	11125
TradeDoubler	15215
Group 4	
Know IT	16457
Malmbergs Elektriska B	18000
Phonera	15978
Semcon	18100
Group 5	
Enea	18362
ITAB Shop Concept B	25965
Svedbergs B	24910
Vitrolife	19947
Group 6	
BioInvent International	30664
Elos B	30945
Image Systems	28200
MultiQ International	28584
Group 7	
Lammhults Design Group B	84481
Precise Biometrics	61182
Consilium B	53974
Probi	46826
Group 8	
Feelgood Svenska	129925
Pricer B	104984
Acando B	99489
Micronic Mydata AB	87037
Group 9	
Geveko B	141047
Karo Bio	154667
Opcon	169599
Rörvik Timber B	247713
Group 10	
PA Resources	1138730
Rederi AB Transatlantic	649282
Midsona B	446769
Concordia Maritime B	349840

Appendix 6 The abnormal return (SEK)

P1												Average	%
2009 Q1													
2009 Q2	1313,13											1313,13	0,00
2009 Q3	1196,50	2401,23										1798,87	36,99
2009 Q4	1334,62	2777,14	1468,91									1860,22	41,66
2010 Q1	1636,31	1721,74	1196,30	2643,65								1799,50	37,04
2010 Q2	1184,83	2105,66	1437,39	3316,26	2408,83							2090,59	59,21
2010 Q3	1314,45	1633,25	1211,40	3567,87	2148,40	2831,40						2117,79	61,28
2010 Q4	1702,26	2096,70	1279,04	4659,70	3387,70	3688,90	1989,62					2686,28	104,57
2011 Q1	569,08	1854,12	1051,55	4370,27	1779,18	3510,57	1418,82	1404,02				1994,70	51,90
2011 Q2	1122,16	2100,42	783,66	2962,95	3022,54	2016,44	1329,58	1449,51	4181,84			2107,68	60,51
2011 Q3	664,26	1557,11	699,83	1478,34	1776,34	942,19	1643,08	1266,20	3111,89	777,97		1391,72	5,98
2011 Q4	363,38	1069,02	442,98	828,56	1214,22	581,38	625,23	795,08	1756,99	439,25	1125,44	840,14	-36,02

P2												Average	%
2009 Q1													
2009 Q2	1298,44											1298,44	0,00
2009 Q3	983,48	1893,70										1438,59	10,79
2009 Q4	1492,93	2705,47	6114,67									3437,69	164,76
2010 Q1	1300,03	2152,90	4667,77	1498,75								2404,86	85,21
2010 Q2	1628,93	2634,94	5591,02	1519,94	1318,76							2538,72	95,52
2010 Q3	1537,60	2481,17	4658,49	1457,08	1704,57	3351,50						2531,73	94,98
2010 Q4	1633,80	2900,39	7290,96	1538,80	1634,67	5640,37	5603,65					3748,95	188,73
2011 Q1	1261,76	2399,86	5070,77	1236,57	1253,36	4437,74	4086,31	1718,98				2683,17	106,65
2011 Q2	1149,90	2714,21	5595,93	1300,94	1136,14	4526,06	3284,00	2374,12	2063,55			2682,76	106,61
2011 Q3	1674,54	2344,85	3806,76	1182,21	1459,56	2405,41	1550,72	1353,30	1026,30	1248,69		1805,23	39,03
2011 Q4	752,91	1271,36	2308,08	747,30	595,55	1453,25	963,39	906,08	857,50	808,45	1520,82	1107,70	-14,69

P3												Average	%
2009 Q1													
2009 Q2	343,11											343,11	0,00
2009 Q3	572,41	1776,76										1174,59	242,34
2009 Q4	674,62	2644,23	2733,31									2017,39	487,98
2010 Q1	489,37	2129,23	1810,26	2260,23								1672,27	387,39
2010 Q2	450,61	2540,90	1810,11	2921,80	4479,96							2440,68	611,35
2010 Q3	537,79	1881,29	1837,43	2631,44	2947,90	1923,49						1959,89	471,22
2010 Q4	559,40	2502,48	2024,44	3156,45	5239,40	2434,36	1637,06					2507,66	630,87
2011 Q1	538,56	1952,51	1776,35	2405,33	3921,20	1947,91	1423,69	1140,08				1888,20	450,33
2011 Q2	638,67	2212,35	1798,23	3449,55	4002,37	2149,37	1607,08	1437,84	1736,99			2114,72	516,34
2011 Q3	490,82	1863,84	1262,85	2922,46	1887,30	1400,37	1170,66	1043,02	1405,68	1440,10		1488,71	333,89
2011 Q4	257,87	854,12	639,77	1903,11	1352,19	878,49	657,27	565,52	517,69	593,85	1305,90	865,98	152,39

P4												Average	%
2009 Q1													
2009 Q2	1541,86											1541,86	0,00
2009 Q3	980,38	3747,97										2364,18	53,33
2009 Q4	2002,48	2801,36	2530,86									2444,90	58,57
2010 Q1	1350,98	2295,58	2230,46	1712,26								1897,32	23,05
2010 Q2	1446,41	1887,65	3424,35	1867,02	783,99							1881,88	22,05
2010 Q3	1335,89	2336,45	3378,57	1920,42	665,44	2901,19						2089,66	35,53
2010 Q4	1571,27	2354,54	4415,99	2173,56	777,23	3228,32	2164,96					2383,69	54,60
2011 Q1	1266,75	2285,80	3980,54	1955,44	934,52	2625,28	1998,18	2481,21				2190,96	42,10
2011 Q2	1642,60	1979,51	3022,74	2068,58	1200,44	2636,80	2289,20	2331,50	1311,07			2053,60	33,19
2011 Q3	1071,40	2364,95	1460,93	1535,70	966,65	3060,05	2099,87	2560,57	1016,06	1056,00		1719,22	11,50
2011 Q4	677,63	1291,18	982,93	882,63	625,70	1533,30	1314,01	1419,20	551,22	617,60	413,09	937,13	-39,22

P5												Average	%
2009 Q1													
2009 Q2	1792,84											1792,84	0,00
2009 Q3	1202,26	596,75										899,50	-49,83
2009 Q4	1686,89	795,11	170,29									884,10	-50,69
2010 Q1	1745,76	489,50	115,38	680,61								757,81	-57,73
2010 Q2	2368,92	544,54	109,34	666,88	573,18							852,57	-52,45
2010 Q3	1486,57	677,32	123,01	513,15	714,07	1070,97						764,18	-57,38
2010 Q4	1982,51	837,57	27,30	540,54	980,30	1343,08	2869,63					1225,85	-31,63
2011 Q1	1469,11	428,28	47,48	650,28	903,15	856,94	2684,09	582,41				952,72	-46,86
2011 Q2	1447,25	505,92	31,15	223,98	872,52	1569,90	2799,50	369,99	1642,99			1051,47	-41,35
2011 Q3	1350,19	290,74	8,89	251,21	553,80	736,05	3117,58	317,08	1210,44	620,43		845,64	-52,83
2011 Q4	358,60	128,91	0,80	123,67	360,90	713,55	1756,50	248,87	713,02	293,95	942,31	512,83	-71,40

P6												Average	%
2009 Q1													
2009 Q2	3102,11											3102,11	0,00
2009 Q3	3028,07	87,93										1558,00	-49,78
2009 Q4	3214,48	191,49	591,56									1332,51	-57,05
2010 Q1	2690,82	227,09	506,82	733,27								1039,50	-66,49
2010 Q2	3261,01	324,35	519,28	1091,41	869,93							1213,20	-60,89
2010 Q3	3920,16	101,98	647,05	555,68	717,73	1119,39						1177,00	-62,06
2010 Q4	5073,54	192,92	623,41	856,48	828,39	1320,57	4715,39					1944,39	-37,32
2011 Q1	4579,49	156,09	529,14	695,52	903,03	1263,54	3629,09	656,89				1551,60	-49,98
2011 Q2	3207,17	376,66	704,75	837,30	527,84	1482,30	3654,17	630,36	961,08			1375,74	-55,65
2011 Q3	1964,83	217,65	786,35	850,97	688,45	1096,10	1628,84	741,63	825,28	1894,23		1069,43	-65,53
2011 Q4	1241,55	184,72	604,54	299,84	386,78	662,67	1145,32	179,04	473,08	1263,24	96,67	594,31	-80,84

P7												Average	%
2009 Q1													
2009 Q2	3615,08											3615,08	0,00
2009 Q3	5948,64	2081,56										4015,10	11,07
2009 Q4	6406,90	2982,35	1585,92									3658,39	1,20
2010 Q1	3665,99	2375,03	1176,08	1390,16								2151,81	-40,48
2010 Q2	4684,45	3434,01	1351,45	1864,59	2876,88							2842,28	-21,38
2010 Q3	3839,62	3185,20	1097,79	1474,95	2356,65	434,15						2064,73	-42,89
2010 Q4	5780,97	4220,03	1501,67	1856,17	2877,86	384,95	739,53					2480,17	-31,39
2011 Q1	4464,83	3871,71	1251,92	1476,04	2351,21	441,98	511,11	534,83				1862,95	-48,47
2011 Q2	4375,70	2884,13	1428,53	1707,18	2605,82	115,85	602,60	509,10	1997,12			1802,89	-50,13
2011 Q3	3079,01	1246,48	1081,48	1228,88	2493,38	145,33	444,06	571,67	909,19	1754,39		1295,39	-64,17
2011 Q4	1838,38	777,29	616,75	872,82	1275,58	66,17	297,69	361,24	604,35	927,16	253,59	717,37	-80,16

P8												Average	%
2009 Q1													
2009 Q2	1936,34											1936,34	0,00
2009 Q3	1655,04	705,65										1180,35	-39,04
2009 Q4	2023,99	713,97	2012,63									1583,53	-18,22
2010 Q1	1836,30	835,71	1707,34	1860,68								1560,01	-19,44
2010 Q2	2724,55	890,04	2654,33	2997,91	2902,93							2433,95	25,70
2010 Q3	1859,37	785,58	1678,63	2142,10	3408,42	1628,16						1917,04	-1,00
2010 Q4	2427,16	863,39	2491,55	3804,25	4180,52	1658,29	392,17					2259,62	16,70
2011 Q1	2246,50	708,92	1761,07	2952,97	4003,55	1376,56	350,13	4636,41				2254,52	16,43
2011 Q2	2968,46	709,06	2281,90	2730,54	2448,16	1350,59	586,36	5138,09	2641,58			2317,19	19,67
2011 Q3	2010,00	499,35	1595,23	1080,32	1239,49	1911,05	417,55	2567,05	2646,14	1196,50		1516,27	-21,69
2011 Q4	1400,63	264,86	819,80	691,03	707,66	939,00	338,08	1775,36	1482,02	872,49	1344,23	966,83	-50,07

P9												Average	%
2009 Q1													
2009 Q2	1049,31											1049,31	0,00
2009 Q3	897,54	1367,20										1132,37	7,92
2009 Q4	1068,72	1764,90	3276,63									2036,75	94,10
2010 Q1	791,68	1261,98	2336,30	2699,75								1772,43	68,91
2010 Q2	692,29	1583,95	2222,31	2163,61	2165,43							1765,52	68,25
2010 Q3	532,68	1731,26	2356,12	2376,99	1394,56	1211,73						1600,56	52,53
2010 Q4	668,47	1950,00	2434,41	3118,96	1711,60	1567,08	2289,64					1962,88	87,06
2011 Q1	651,71	1541,54	2104,79	1693,13	1248,62	1228,76	2039,21	1971,47				1559,90	48,66
2011 Q2	662,69	1660,76	2192,33	2076,54	1674,53	1773,74	2027,54	1502,51	863,10			1603,75	52,84
2011 Q3	520,74	1762,26	2302,51	2008,87	868,52	1025,54	1780,71	1521,85	680,26	1215,12		1368,64	30,43
2011 Q4	292,49	1111,88	1109,79	887,52	473,24	753,27	914,48	429,66	450,07	728,24	470,31	692,81	-33,97

P 10												Average	%
2009 Q1													
2009 Q2	1705,55											1705,55	0,00
2009 Q3	1823,02	3561,51										2692,27	57,85
2009 Q4	2306,68	4782,81	1517,84									2869,11	68,22
2010 Q1	1723,91	3510,23	1158,75	1567,42								1990,08	16,68
2010 Q2	2207,91	4408,13	1125,79	1975,34	1981,45							2339,72	37,18
2010 Q3	1953,44	3390,90	1077,33	1523,67	2155,85	1830,83						1988,67	16,60
2010 Q4	2450,60	5857,53	1484,23	1996,38	2193,57	2636,02	1894,29					2644,66	55,06
2011 Q1	2125,71	3740,21	1270,26	1559,00	1759,95	1356,94	1336,70	4347,31				2187,01	28,23
2011 Q2	2220,93	4141,60	1326,70	1856,57	1885,89	1929,55	1811,76	3117,33	2225,36			2279,52	33,65
2011 Q3	1421,72	1855,86	927,79	1454,23	2135,36	1392,32	1005,68	1816,23	1484,68	1293,59		1478,75	-13,30
2011 Q4	971,47	1193,83	589,68	909,40	1213,34	712,24	763,05	1209,81	978,64	841,32	878,14	932,81	-45,31