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EFFECTS OF ANALYSTS' RECOMMENDATIONS ON STOCK PRICES ON NASDAQ HELSINKI IN 2013-2022

Bachelor's thesis

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I hereby declare that I have compiled the thesis independently
and all works, important standpoints and data by other authors
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has not been previously presented for grading.

The document length is 9115 words from the introduction to the end of the conclusion.

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ABSTRACT

This thesis aims to determine if buy and sell recommendations set by analysts result in stocks' abnormal returns during the period of 2012 to 2022, and if this association is different for the recommendations issued around the publication of the annual and quarterly reports. This study used quantitative methods, specifically, an event study methodology with a 10-day event window. The abnormal returns and cumulative abnormal returns are calculated for 111 companies from Nasdaq Helsinki by comparing stock returns to expected returns obtained from the market model, followed by the statistical significance tests. The results showed high significance for the mean abnormal and mean cumulative returns suggesting that there is investment value in the analyst recommendations in Nasdaq Helsinki -companies.

Keywords: Analyst Recommendations, Abnormal Returns, Cumulative Abnormal Return, Event Study

INTRODUCTION

A lot of money is poured every year into the pockets of analysts who will provide insightful information for their customers and other investors. Not only is the analysis supposedly good for investment decisions for the analysts and the companies they work for but the effect of people acting like a herd of sheep might bolster the recommended effect. Kaminsky et al. (2003) defines herding as a phenomenon where one decision could influence people to act accordingly to others. In this case, a recommendation of strong buy, buy, sell, or strong sell could bear the according positive and negative effects on the stock prices which they concern.

Analysts' recommendations have been studied in the past by quite a few individuals; however the Finnish market remains relatively untouched regarding this subject. Similarly, the majority of studies conducted concentrate on the general effect a recommendation has on a stock price without a clear distinction between the effects of buy and sell recommendations. Finally, the prior literature tends not to differentiate between some recommendations, for instance, recommendations near to quarterly reports.

Analysis conducted on the Finnish stock market is mainly done by Finnish companies and individuals. Most notable analysis company for public companies on Nasdaq Helsinki is Inderes Oyj which was founded in 2009. Other sources for recommendations include banks that operate in the same market area however the data is not as accessible since it might be restricted to the public since only the wealthier clients of these banks have access to this information through their higher client status. Newspapers such as Taloussanomat and Kauppalehti also provide recommendations for some stocks of the Nasdaq Helsinki -companies.

This bachelor's thesis will examine the impact of analysts' recommendations on Nasdaq Helsinki -companies' stock prices during the period of beginning 2013 to the end of 2022. This study will focus on the recommendations provided by analysts and how they influence the behavior of investors in the market in the short term since Nordic countries are quite neglected in these studies let alone Finland. Accoring to Hall & Tacon (2010), there are three outputs that are of great

relevance for investors. These are target prices, earnings estimates and stock recommendations. This study will aim its focus on the last one, the stock recommendations i.e., is to research the effect of analysts' recommendations on stock prices and see if there are any differences in the effects when excluding specific recommendations. Evaluating abnormal returns with the use of market model should help to understand the possible effects of analysts' recommendations. From this point on, when referring to days it means working days unless it is separately defined otherwise.

The research question is as follows: How do the different stock price predictions (buy/sell recommendations) set by analysts affect the movement of the stock prices on Nasdaq Helsinki?
To find the meaning behind the research question there are two research hypotheses. The hypotheses will be presented in the theoretical framework since they are based on previous theories and studies on the topic. In this study the effects of recommendations are studied in a short-term manner to see if there are any immediate effects from the recommendations.

For this thesis, abnormal returns (cumulative included) combined with the market model are used to investigate how buy and sell recommendations affect stock prices. Data was acquired from Thomson Reuters Eikon estimations by going through every company which was listed in the Nasdaq Helsinki and extracting the recommendations manually. The recommendations were provided by Inderes' analysts. The time series is from the start of 2013 to the end of 2022 as mentioned before. The total number of companies that had sufficient data to study the effects was 113 in total and 111 when accounting for conditions to exclude.

This thesis is organized as follows. The first chapter reviews theoretical and empirical literature that can be used to understand the link between analysts' recommendations and stock prices. The second chapter explains the data and methodology used in the present study. The third chapter presents empirical findings. The final chapter provides conclusions.

1. LITERATURE REVIEW

This chapter examines the theoretical and empirical background that links analysts' recommendations and stock returns, followed by the formulation of the hypotheses.

1.1. Efficient marker hypothesis

Efficient markets can be defined as markets where security prices always "fully reflect" the available information, Fama (1970). This information is not limited to only financial information but includes non-financial information as well that is of any relevance to a company. The job of a stock market analyst is to collect, analyze, and process the available information and data. This is done to be able to estimate the movement of a stock and produce insightful reports of a company's future. The less experienced market dwellers are then paying for this information since they do not have the time or lack the capabilities to process and produce this information by themselves.

Fama (1965, p. 56) states that a market where there is a large number of rational profit-maximizers actively competing each other, and trying to predict the future values of individual securities of a market and where crucial current information is accessible freely by almost any participant, is called an efficient market. Due to the market being highly competitive between the profit-maximizers, this leads to a situation where the price of security always reflects the effects of information that is from past, present, and expected future events. Therefore, according to the theory of efficient markets, the actual price of a security is a competent measure of its intrinsic value. Although, important to note is that an efficient market does not imply that it is impossible for a stock's price to deviate from its true value as long as the deviation is random, according to Damodaran (2012).

The market where the price of a security "fully reflects" all available information must include these three conditions that are sufficient for an efficient capital market according to Fama (1970): (1) when trading securities, there are no transactions costs; (2) all market participants have full and costless access to all available information; (3) the implication of current information for the

current price and distributions of future prices of each security is agreed on by all market participants.

An efficient market can be classified into three levels of efficiency which include *Weak form, semi-strong form,* and *strong form,* according to Fama (1970). The weak form compiles of only historical prices (or returns), and that is the only subset of information that is of any interest. Semi-strong form's subset of information which bears any interest is whether prices efficiently adjust to other information that is obviously publicly available to all and how the prices "fully reflect" this information. The third and last level of efficiency is the strong form, where the concern is that investors or groups might have monopolistic access to any information relevant to price formation. The semi-strong market efficiency hypothesizes that investors should not be able to trade profitably on the sole basis of available public information which does include analyst recommendations. Yet, according to Barber et al. (2001), research departments of brokerage houses pour massive amounts of money into security analysis, apparently due to the fact that these companies and their clients believe its use can achieve superior returns.

1.2. Analysts' recommendations and stock prices

Damodaran (2012) states that the position held by analysts in the market is a privileged one and explains that this is due to analysts operating at the nexus of private and public information. This information which analysts possess is then processed and used to create reports and buy/sell recommendations for companies' stocks. According to Damodaran (2012), both buy and sell recommendations influence stock prices; however, the sell recommendations tend to have more of an effect compared to buy recommendations. The U.S. Securities and Exchange Commission (2010) confirms this as well while analyzing analysts' recommendations. Therefore, there could exist profitable investment strategies that roll around the publicly available analysts' recommendations (Barber et al., 2001; Stickle, 1995; and Womack, 1996, among others).

Cowles (1933) conducted a study "*Can stock market forecasters forecast?*" in which he researched the ability of forecasting in the financial markets. His study had the top 16 leading financial service companies under surveillance for four and a half years, starting from January 1, 1929, and ending on July 1, 1932. His study found that only six, less than half of the 16 companies, outperformed the average common stock in the study period. The study concluded an average annual effective

rate of all the financial service companies, arriving at - 1.43%. The highest-performing one, "service 1", had an EAR of 20.8% and the lowest-performing one, "service 16", had an EAR of – 33.0%. Cowel (1933) states that the analysis conducted suggests a conclusion that the success of a financial service could not be definitively attributed to skill but is rather a result of chance.

Stickel (1995) analyzed buy and sell recommendations provided from Zacks Investment Research for a four-year period starting from 1988 and ending in 1991. He states that to compare these recommendations the scale had to be on the same scale which many for his luck used the five-point scale where: 1 = Strong buy, 2 = Buy, 3 = Hold, 4 = Sell, and 5 = Strong sell. Other brokerage house scales that were not five-point were converted by Zacks' conversion to a five-point scale. The study included 80 brokerage houses and 1 510 individual analysts. Almost 55% of all recommendations analyzed in the study are buys, 33% are holds, and only 12% are sells which is similar to Womack's (1996) observation of recommendation distribution where there are more buys than sells when it comes to recommendations. The event window for the study which Stickel (1995) conducted was 11-days which included some days before and after the Zacks' date due to uncertainty of the actual recommendation date with 0-days being the Zacks' date and then taking -5 and +5 days for the short window and -5 and + 120 days for the long window. These event windows resulted in an increase of 1.16% on average in stock prices that were associated with a buy recommendation and a decrease of 1.28% on average in stock price that were associated with a sell recommendation. However, Stickel (1995) notes that these results can be misleading due to the inclusion of the effects earnings forecasts and announcements carry, along with less-informative, month-end-dated recommendations.

Womack (1996) did an analysis on major U.S. brokerage companies and more specifically on their buy and sell recommendations of stocks made by their security analysts. In his article he provides evidence on stock price formation and on the fact that analysts are capable of predicting or influencing stock prices. The study has a total of 14 major U.S. brokerage companies, and a three-day window to study the event of recommendations with focus on analyzing the price and volume reactions in regards of the different types of recommendations. This is also accompanied in months before and after the event. Womack (1996) documented that size-adjusted prices increased 3% on average when introduced to a buy recommendation and a decline of 4.7% when introduced to a sell recommendation within the three-day window of the event. He also documents that there is significant stock price drift occurring after a buy recommendation towards the target price set by the analysts with the incremental mean size-adjusted return of 2.4% for the first month (starting

two days from the initial recommendation) after the event. Sell recommendation on the other hand had an incremental mean size-adjusted return of -9.1% over a more substantial period of six months. Womack (1996) also states that sell recommendations are less common than buy recommendations just like since buy recommendations occur seven times more often than sell recommendations suggesting that analysts are more cautious with issuing sell recommendations due to "costs" being greater compared to those of buy recommendations.

Barber et al. (2001) study for the period of 1985 to 1996, including more than 360 000 recommendations from 269 brokerage houses and 4340 analysts using Zacks database, finds that buying (selling short) stocks with the most (least) recommendation accompanied by daily portfolio rebalancing with timely response to changes in recommendations do generate gross annual abnormal return greater than 4%, and diminishing returns occurring with portfolios that are not rebalanced as often or the reaction to changes in recommendations is delayed. The study conducted was larger in comparison to what Stickel (1995) and Womack (1996) previously did. Barber et al. (2001) concluded that an investing strategy using stock recommendations as a base line could be profitable. Lidén (2006) on the other hand studied Swedish newspapers and magazines regarding business for recommendation posted by both journalists and analysts of brokerage firms and banks for the time period of 1996 to 2000 and found out that a strategy similar to what previously mentioned authors used would earn a normal return for an investor over 24-month post-event period. He also studied if only selling stocks short regardless of the recommendations being a buy or sell, the investor's abnormal return would yield 14% thus concluding that buy recommendations could be misleading and sell recommendations being more reliable. Something to note as well was that journalists' recommendations had a larger impact on a stock's price development compared to a recommendation made by an analyst.

The Finnish market has been examined in a similar manner (Kontio, C. 2016) for the period of 2006 to 2015 where the data was collected from Bloomberg Terminal and analyst recommendations were checked for longer term value. The evidence suggests that more favorable recommendation led to higher abnormal returns, and vice versa where unfavorable recommendations were sold-short resulting in an annual abnormal return over 14% if the portfolio is rebalanced frequently enough similarly to the conclusion of Barber et al. (2001) with diminishing returns if rebalancing was neglected. These recommendations were checked on a daily basis however it did not take into account the effects of quarterly reports and analyst tipping. During the period of 2018 to 2020 the OMXS30-companies were studied by Dahlberg & Lööf

(2021). There was not found statistically significant impact with the event window lasting 21 days and where the sell and buy recommendations were researched for abnormal returns except for one occasion in both sell and buy events. This study on the other hand did take into account external events such as quarterly and annual reports thus excluding recommendations made -5 days to +5 days to these events.

1.3. Analysts' recommendations and market manipulation

Efficient To get a clear view of why this study only used reputable recommendations, this section will explore the reason for it. The practice of manipulating markets has been recorded to first appear as early as the seventeenth century (Frunza, 2015). Stock market manipulation can be intentional or unintentional. Reputable companies and analysts that make analysis on stocks are often seen as trustworthy sources; however since social media has become more pronounced in our day-to-day life it has also started to take its fair share from the stock market sector.

People who invest and follow influencers and other sources besides just the reputable companies regarding stocks has enabled the creation of a malicious niche for stock market manipulation via publishing recommendations where untrustworthy sources disguise themselves as trustworthy. They feed their followers incorrect and/or manipulated information and recommend stocks (pump) based on this feed. The scheme promoter often holds a substantial position in this particular stock and is ready to sell the position (dump) when the price of the stock acts according to their recommendation according to Renault (2017). It is important to know that even though reputable companies are considered more trustworthy, there could always be underlying motives to mislead for one's own gain. This could be seen as publishing information on a company that gives a more negative view of some situation than in reality the situation bears, for example. These conflicts of interest are caused by larger clients that prefer more favorable research report for themselves since these publications attract potential new clients for them, and vice versa more negative ones for their competition, which then again drives the competition's clients to the competitor.

Analyst tipping on the other hand is a scenario where analysts gain access to company details and information before the public does, and where the analysts then "tips" the information forward to their largest clients in advance. This is done to achieve larger returns from the public press release which is held on a later date. This then naturally affects the stock price of that particular company.

Mao et al. (2019) states that there is evidence of analyst tipping on Finnish stocks where trading patterns conducted by domestic institutional investors to buy (four days prior) and to sell (one day prior) to buy upgrades and sell downgrades respectively. This is one of the foundations for this study since this determines the start of the event window which is the -4 days from the publishing of a recommendation. Evidence for abnormal institutional trading behavior is most likely caused by sell-side analysts due to the incentive of boosting their commissions by providing early access to private information for their main clients. Evidence of this has been found in at least four other markets according to Mao et al (2019); United States studied by Irvine et al. (2007), Australia by Lepone et al. (2012), Korea by Kim et al. (2013), and Sweden by Anderson & Martinez (2014).

1.4. Hypotheses development

On the one hand, Efficient Market Hypothesis (EMH) assumes that stocks are always traded at their fair value on exchange, creating a phenomenon where it is impossible to purchase undervalued stocks or sell stocks with inflated prices which leads to the fact that it would be impossible to outperform the overall market with stock selecting and market timing. At the sine time, however, Barber et al (2001), Stickel (1995), Womack (1996) among others suggest in their findings, there is a possible strategy for trading stocks involving the use of analysts' recommendations. Similarly, Mao et al. (2019) provides evidence of the analyst tipping regarding stocks which then affects the stock prices before any recommendation is officially published.

The thesis relies on this contradiction to formulate the following hypotheses:
H1: Stock prices of Nasdaq Helsinki -companies are positively (negatively) affected by analysts' buy (sell) recommendations enabling abnormal returns on short-term period.

H2: Magnitude of the effects caused by analysts' buy and sell recommendations are higher when recommendations are published near quarterly and annual reports.

The second hypothesis follows from the observation that there is very little knowledge on if the effects of analysts' recommendations differ due to quarterly and annual reports.

2. DATA AND METHODOLOGY

This chapter contains the data selection and research methodology for the thesis. Firstly, introducing the sample selection and then exploring the measurement of variables, and finalizing the chapter with discussion of possible issues related to methodology.

This study is an event study since one the cornerstones of Efficient Market Hypothesis is the assumption that all security prices are affected by an event due to the rationality of investors in the market. As MacKinlay (1997) states, the impact of an economic event can be measured using the prices of securities and observing them over a relatively short period. In this thesis the event is the publication of a buy or sell recommendation for a stock. The event window consists of 10 days, 4 days prior and 5 days after the recommendation to see if the recommendations have any immediate and cumulative effects on the stock prices. As stated in chapter 1., the event includes 4 days prior to the recommendation due to a study by Mao et al. (2019) suggesting evidence on analyst tipping regarding Finnish stocks which then affects the price of the stock already before any recommendation is officially published. This study has two study groups, where the first study group takes into account possible external events that could affect the stock price without the analyst recommendation, and the second group takes every recommendation at face value.

2.1. Sample Selection

The number of investors has increased almost every year in Finland. There were over 1 000 000 individual Finnish people who owned stocks of Finnish public companies at the beginning of 2023 (Euroclear Finland, table development of the number of shareholders). A study conducted by Keloharju & Lehtinen (2015) on the ownership of the Finnish market defined a market dominated by foreign investors as a market where there is over 50% foreign investor participation. Finland used to be dominated by foreign investors however in 2023 the foreign ownership was 43.83% (Euroclear Finland, table foreign ownership). This is important to acknowledge since most recommendations done for the Nasdaq Helsinki -companies' stocks come from Finnish media outlets which are naturally mostly followed by the residents and citizens of Finland.

This study is conducted over a time period 10 years, starting from January 1, 2013, and ending December 31, 2022, with the reason behind the selection having good, neutral, and bad times in the market giving a more realistic picture. As Stickle (1995) converted all recommendation in his study to the five-point scale in Zacks' own converter, recommendation data for this thesis was acquired from Thomson Reuters Eikon datastream and the majority of the recommendations for Finnish stocks used a four-point scale where 1 = Strong sell, 2 = Sell, 3 = Buy, and 4 = Strong buy, thus completely leaving out the option of Hold which would be equal to the number 3 in a five-point scale. Since companies in Nasdaq Helsinki have relatively small amounts of historical data regarding recommendations with five-point scale, it is only appropriate to mitigate the risk of wrongful conversion by using only recommendations which have the four-point scale as a base and leave out the other recommendations which have the five-point scale. This leaves Inderes as the only viable analyst house to gather recommendation data from. Interestingly, as found out by Stickel (1995) and Womack (1996) analysts publish buy recommendations with a lower threshold than sell recommendation. Leaving out the upgrades and downgrades from sell-to-hold and buy-to-hold respectively means that no unnecessary clutter will be in the data with a four-point scale, although one recommendation by Inderes for one company had an option of hold which led to the exclusion of that particular hold recommendation due to it most likely being a fluke in the Thomson Reuters Eikon datastream. Also, to study the differences between recommendations near quarterly and annual reports of companies, recommendations made -5 or +5 days from the recommendation will be excluded from the first study group. These quarterly and annual reports were acquired from Nasdaq Helsinki while filtering for Nasdaq Helsinki as the market, and for category I used *Osavuosikatsaus (Q1 and Q3)*, *puolivuosikatsaus*, *tilinpäätöstiedote*, *Neljännesvuosikatsaus*, and *Neljännesvuosittain annettavat tiedot* where possible and valid with the corresponding company. These translate to Quarterly report (Q1 and Q2), half-year report, financial statement, fourth quarterly report, and information to give quarterly respectively.

During the initial screening, there were 143 listed companies on Nasdaq Helsinki of which 113 had sufficient historical data to study the effects of analysts' recommendations for both study groups. The total number of recommendations for these groups were 845 and 1587 respectively. Of these 1587 recommendations 897 were buys and 689 were sells during the study period, and after the exclusion of recommendations published within the 11-day window of quarterly and annual reports, the number of buy and sell recommendations for the first group was established meaning that in the first study group there were buys and sells of 482 and 362 respectively.

This study will exclusively focus on buy and sell recommendations meaning strong buys = buys and strong sells = sells as well. Also, since data is strictly from 1.1.2013 – 31.12.2022 this means that recommendations made before 2.7.2013 had to be excluded due to the estimation window being -125 to -5 workdays causing a lack of data to establish proper parameters to study the effects. The same problem is associated with company IPO and/or data being short for the first few recommendations. These exclusions caused the number of companies to drop to 111 in total. Recommendations for the first group was then 801 of which 456 were buys and 344 were sells, and for the second group there were 1529 recommendations of which 864 were buys and 664 were sells. The total buys and sells do not sum up to 801 and 1529, but to 800 and 1528 due to one company having an unexplained option of hold in the data. This means that the total recommendations for the first study group is exactly 800, and for the second study group 1528.

2.2. Measurement of Variables

Quantitative methods will be used for both hypotheses which were presented in chapter 1.4. Abnormal return (A.R.) and cumulative abnormal return (CAR) will be used to investigate these phenomena. In accordance with MacKinlay (1997) and Lidén (2006), the event's effect on stock prices can be estimated as the A.R. In this formulation the normal expected return is subtracted from the actual ex-post return that was generated within the event window during the event. According to Strong (1992) it is critical to correctly specify the normal return in order to have successful application of the method. OMXH25 will be used for modelling the normal returns since it gives a very good representation of the market development in Finland due it containing the 25 most traded stocks and is also value weighted. MacKinlay (1997) continues that estimated A.R.s can then be aggregated by measuring CARs to draw an interpretation of the effect the event has. Alpha and Beta are calculated for each recommendation to establish A.R.s and CARs for every company after which the standard error is calculated in similar manner and used to establish how many of the recommendations are significant by themselves. The standard error for the whole study (all companies and recommendations combined) will be estimated for the average A.R.s and CARs during the event's estimation window after which the significance of the average A.R.s and CARs will be tested by dividing the A.R.s and CARs by the standard error. The standard error for the whole event study is conducted by taking the average return for all recommendations published from the market model during the estimation period ($\tau = -125$ to $\tau = -5$) between the 111

companies. All these steps are repeated for the first study group as well when exclusion takes place. Buy and sell recommendations are separately tested to see if there are more volatile effects due to recommendation being one or the other. To gain a fair view of A.R.s, this study will not consider any transaction costs as they vary from broker to broker starting from as low as 0.00€ and going up from there depending on the client's profile. Also, the Efficient Market Hypothesis by Fama (1970) has the condition that when trading securities, no transaction costs will be taken.

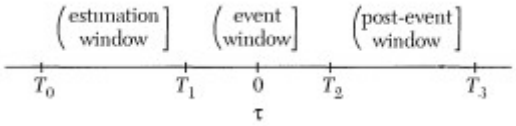

Figure 1. Timeline for an event study
Source: MacKinlay (1997)

Proposed by MacKinlay (1997) and used by Lidén (2007) and Lööf & Dahlberg (2021) in their studies, returns will be indexed in event time τ where $\tau = 0$ represents the time when the event occurs, the event date. Then $\tau = T_1 + 1$ to $\tau = T_2$ is the event window, and $\tau = T_0 + 1$ to $= T_1$ represents the estimation window, and $L_1 = T_1 - T_0$ and $L_2 = T_2 - T_1$ represent the lengths of estimation window and the event window respectively. MacKinlay (1997) suggests using an estimation window of 120 days which means the estimation window for this thesis is the time period of $\tau = -125$ to $\tau = -5$, and the event window is $\tau = T_{-4}$ to T_{+5}.

2.2.1. Abnormal return

As mentioned before, effects caused by analysts' buy and sell recommendations on stock prices will be measured by estimating the abnormal returns (AR) within the event period with the following expression where i = stock and τ = time:

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau}|X_\tau) \quad (1)$$

$$E(R_{i\tau}|X_\tau) = \hat{a}_i + \hat{\beta}_i R_{m\tau}$$

where $AR_{i\tau}$ stands for the abnormal return, $R_{i\tau}$ for the actual return, and $E(R_{i\tau}|X_\tau)$ for the normal return where τ stands for time period and X_τ stands for the conditioning information for the normal return model (MacKinlay, 1997). The mean abnormal returns ($\overline{AR}_\tau$) can be estimated for every τ in the event window:

$$\overline{AR}_\tau = \frac{\left(\sum_{i=1}^{N} AR_{i\tau}\right)}{N} \quad (2)$$

where N stands for the number of observations (Lidén, 2007).

2.2.2. Cumulative abnormal return

This study requires the use of cumulative abnormal returns (CAR) in order to draw conclusions on whether the studied events possess investments value, and to potentially document stock price drifts. There is a possibility for CARs to be cumulated through time and across securities which then means that the CAR for an individual security i through time ($CAR_i(\tau_1, \tau_2)$) is defined as the sample CAR through the event window τ_1 to τ_2 and is estimated with the following formula:

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau} \quad (3)$$

where $\sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau}$ stands for the CAR for security i (MacKinlay, 1997). The mean cumulative abnormal returns ($\overline{CAR}_\tau$) can be estimated for every τ in the event window:

$$\overline{CAR}_\tau = \frac{\left(\sum_{i=1}^{N} CAR_{i\tau}\right)}{N} \quad (4)$$

where N stands for the number of observations (Lidén, 2007).

2.2.3. Market model and its estimation

According to Cable & Holland (1999) the market model (MM) is basically the general and capital assets pricing models (CAPM) however just having a suppressed risk-free rate. MacKinlay (1997) adds that the use of MM can reduce the variance related to abnormal returns in contrast to the constant mean return model. He continues to explain that abnormal return's variance is reduced by excluding the portion of the return that is related to the market's return which then can possibly lead to a heightened ability to detect event effects. To summarize what MM is according to MacKinlay (1997), it is a statistical model where any given security's return is related to the market portfolio's return where the model's linear specifications follow the assumed joint normality of asset return. The market model for any given security i is as follows:

$$R_{i\tau} = \alpha_i + \beta_i R_{m\tau} + \varepsilon_{it} \quad (5)$$

where $R_{i\tau}$ represents the return of security i for time period τ, $R_{m\tau}$ the overall market return for time period τ, and α_i, β_i, and ε_{it} represent the intercept term, slope coefficient, and error term respectively, and are the parameters of the market model (MacKinlay, 1997). To calculate the market model parameters ordinary least square (OLS) estimators for the examination's estimation window for company i in the event study, we follow the following formulas:

$$\hat{\beta}_i = \frac{\Sigma_{\tau=T_{0+1}}^{T_1} (R_{i\tau} - \hat{\mu}_i)(R_{m\tau} - \hat{\mu}_m)}{\sum_{\tau=T_{0+1}}^{T_1} (R_{m\tau} - \hat{\mu}_m)^2} \quad (6)$$

$$\hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i \hat{\mu}_m \quad (7)$$

$$\hat{\sigma}_{\varepsilon_i}^2 = \frac{1}{L_1-2}\sum_{\tau=T_0+1}^{T_1}\left(R_{i\tau} - \hat{\alpha}_i - \hat{\beta}_i R_{m\tau}\right)^2 \quad (8)$$

where $\hat{\mu}_i = \frac{1}{L_1}\sum_{\tau=T_0+1}^{T_1} R_{i\tau}$

and $\hat{\mu}_m = \frac{1}{L_1}\sum_{\tau=T_0+1}^{T_1} R_{m\tau}$

where $R_{i\tau}$ is the return for security i and $R_{m\tau}$ for the market in the event period τ (MacKinlay, 1997).

To be able to draw conclusions from the results, statistical significance tests (t-tests) with significance levels of 1%, 5%, and 10% will be done, and to test if analysts' recommendations have an effect on stock prices during the event window, the mean abnormal return ($\overline{AR}_\tau$) for each τ will be tested for significant difference from zero. A statictically distinct outcome from a zero would imply that an analyst's recommendation do affet the stock prices in some manner. Similarly, mean cumulated abnormal return ($\overline{CAR}_\tau$) for each τ will be tested in the same manner for potential price drifts. Lastly, to see if there is any investment value in analysts' recommendations, the post-event mean cumulative abnormal return ($\overline{CAR}_{\tau 0,\tau 5}$) will be tested as well for statistically significant difference from zero as in the two previous tests for $\overline{AR}_\tau$ and $\overline{CAR}_\tau$. The following hypotheses can be formulated for these tests respectively:

H0: The mean abnormal returns ($\overline{AR}_\tau$) = 0
H1: The mean abnormal returns ($\overline{AR}_\tau$) ≠ 0

H0: The mean cumulative abnormal returns ($\overline{CAR}_\tau$) = 0
H1: The mean cumulative abnormal returns ($\overline{CAR}_\tau$) ≠ 0

H0: The post-event mean cumulative abnormal returns ($\overline{CAR}_{\tau 0,\tau 5}$) = 0
H1: The post-event mean cumulative abnormal returns ($\overline{CAR}_{\tau 0,\tau 5}$) ≠ 0

2.3. Limitations

As presented before in the introduction and chapter 2.1., all recommendations were acquired from Thomson Reuters database meaning the data is only limited to that. Other databases could be used as well to gain an even larger field of recommendations to analyze. The data used to exclude some

of the recommendations that was acquired from Nasdaq Helsinki had an issue during the making of this thesis that all relevant data might not have been under the same filtering methodology which means that relevant data might be under other filters. This however was problematic since the data had to be manually skimmed through and extracted thus making it only reasonable to filter under the filters which made most sense.

The banking holidays had to be added manually to gain accurate results between the study period however this does not take into account any irregularities such as a stock being put on hold for trading due to reason X or Y thus possibly slightly altering the end results. Also, every analysis was used equally which could mean that results might differ if analysis would be categorized by the rating an analyst bears or even by a brokerage house. In this study only one brokerage house was used due to lack of valid recommendations for this particular study.

There is a possibility that external events other than the quarterly reports and financial statements affect stock prices within the 120 day estimation period and the 10 day event window such as a large position suddenly being sold or bought by an entity. Also, recommendations that have a five-point scale were completely left out and these might have interesting effects in the current way of establishing the results. The post-event period could be longer in order to see if there are any further effects close to a recommendation however this study was strictly studying the very short-term effects of recommendations. All insignificant recommendations were included in the study since as an investor it can be hard to predict if something has a significant effect or not on a stock price. To summarize this argument, it is a broad based phenomenon meaning something could be affected by one huge external event or it could be that it is caused by herding, in this case, people buying or selling stocks according to recommendations.

One substantial aspect of the conduction of this study should be noted that the effects might be different if strong buys (S.B.) and strong sells (S.S.) would be separately considered from buys (B) and sells (S) since them being considered as "higher value" recommendations they might also bear a very different outcome on average compared to the "lesser value" buys and sells. For future reference it might be interesting to see if there are more considerable effects to strong buys and sells while also considering the potential risk rating a company has.

3. RESULTS AND DISCUSSION

In this chapter the aim is to present the obtained results from this event study. There will be subchapters for results regarding solely buy recommendations and solely sell recommendations with each of them including the results of both first and second study groups to get a better understanding of the results during each time period during the event window, and lastly the post-event results will be presented for both buy and sell recommendations respectively with the chapter ending with general discussion of the results.

3.1. Buy recommendations

Tables 1 and 2 represent the mean abnormal return ($\overline{AR}$) and the mean cumulative abnormal return ($\overline{CAR}$) respectively for buy recommendations for the second study group. In the tables, each day within the event window is shown on the left side of the table from τ = -4 to τ = 5, and 0 representing the event date which in this case is the day when a recommendation was published. In buy recommendations we can see that the $\overline{AR}$ is statistically significant on the 1% level from 2 days before the event to 1 day after the event. There is very high significance on the event date compared to the other dates with an $\overline{AR}$ of 1.18%. The day 4 after the event is also statistically significant, however it seems to be more of an outlier and most likely caused by something else than buy recommendations. From τ = -4 to τ = 2 (except for τ = -3) are statistically significant on the 5% level however since there is some discrepancy with τ = -4 and τ = -3 due to the latter being only significant in the 10% level, it would be reasonable to assume that something else is affecting these results other than buy recommendations. The 1% level being very consistent suggests it to be much more trustworthy even though the percentages seem to make sense due to balancing of the market where a sudden rise in price is followed by corrective movement slightly backwards.

In the $\overline{CAR}$ we can see that the whole event window is statistically significant on the 1% level except for the τ = -4 which is significant on the 5% level. This suggests that the results are very much connected to each other. If one would buy a stock 4 days prior to the event, they would receive $\overline{CAR}$ of 2.27% on the event date and peak their $\overline{CAR}$ 1 day after the event with $\overline{CAR}$ of 2.64%. If one held a stock throughout the 10-day period, they would result in an $\overline{CAR}$ of 2.13%. These results suggest that there is investment value in the second study group when accounting for only buy recommendations and when no recommendations are excluded.

Table 4. Mean AR, Buy recommendations

τ	Mean AR	t-stat.
-4	0.19%	2.302••
-3	0.15%	1.756•••
-2	0.24%	2.849•
-1	0.52%	6.304•
0	1.18%	14.168•
1	0.37%	4.483•
2	-0.18%	(-)2.139••
3	-0.03%	(-)0.418
4	-0.28%	(-)3.365•
5	-0.02%	(-)0.24
Significant at 1% (•), 5% (••), 10% (•••)		

Source: Author's own calculations

Table 3. Mean AR, Buy recommendations

τ	Mean CAR	t-stat.
-4	0.19%	2.302••
-3	0.34%	4.058•
-2	0.57%	6.907•
-1	1.10%	13.210•
0	2.27%	27.378•
1	2.64%	31.861•
2	2.47%	29.722•
3	2.43%	29.304•
4	2.15%	25.940•
5	2.13%	25.699•
Significant at 1% (•), 5% (••), 10% (•••)		

Source: Author's own calculations

Table 2. Mean AR (exclusions), Buy recommendations

τ	Mean AR (excl.)	t-stat.
-4	0.04%	0.383
-3	0.08%	0.741
-2	0.12%	1.060
-1	0.51%	4.650•
0	1.35%	12.333•
1	0.47%	4.296•
2	-0.03%	(-)0.269
3	0.04%	0.322
4	-0.42%	(-)3.872•
5	0.14%	1.236
Significant at 1% (•), 5% (••), 10% (•••)		

Source: Author's own calculations

Table 1. Mean CAR (exclsuions), Buy recommendations

τ	Mean CAR (excl.)	t-stat.
-4	0.04%	0.383
-3	0.12%	1.124
-2	0.24%	2.184••
-1	0.75%	6.834•
0	2.10%	19.167•
1	2.57%	23.463•
2	2.54%	23.194•
3	2.58%	23.516•
4	2.15%	19.644•
5	2.29%	20.880•
Significant at 1% (•), 5% (••), 10% (•••)		

Source: Author's own calculations

When adding the condition of excluding recommendations that happened within -5 to +5 days from an annual or quarterly report, we have the following results for buy recommendations of the first study group where the results are represented in Tables 3 and 4 for $\overline{AR}$ and $\overline{CAR}$ respectively. Similar to the study group two results regarding the $\overline{AR}$, the fourth post event date seems to be an

outlier and thus the effects caused on that particular day are explained by something else than an occurrence of a buy recommendation. Statistically significant on 1% level we once again have the τ = -1 to τ = 1 period with an $\overline{AR}$ of 1.35% on the event date which is 0.17% units higher than the second study group's $\overline{AR}$ for that date. Similarly, the first post-event date also yields a higher $\overline{AR}$ of 0.47% compared to the 0.37% the second study group has.

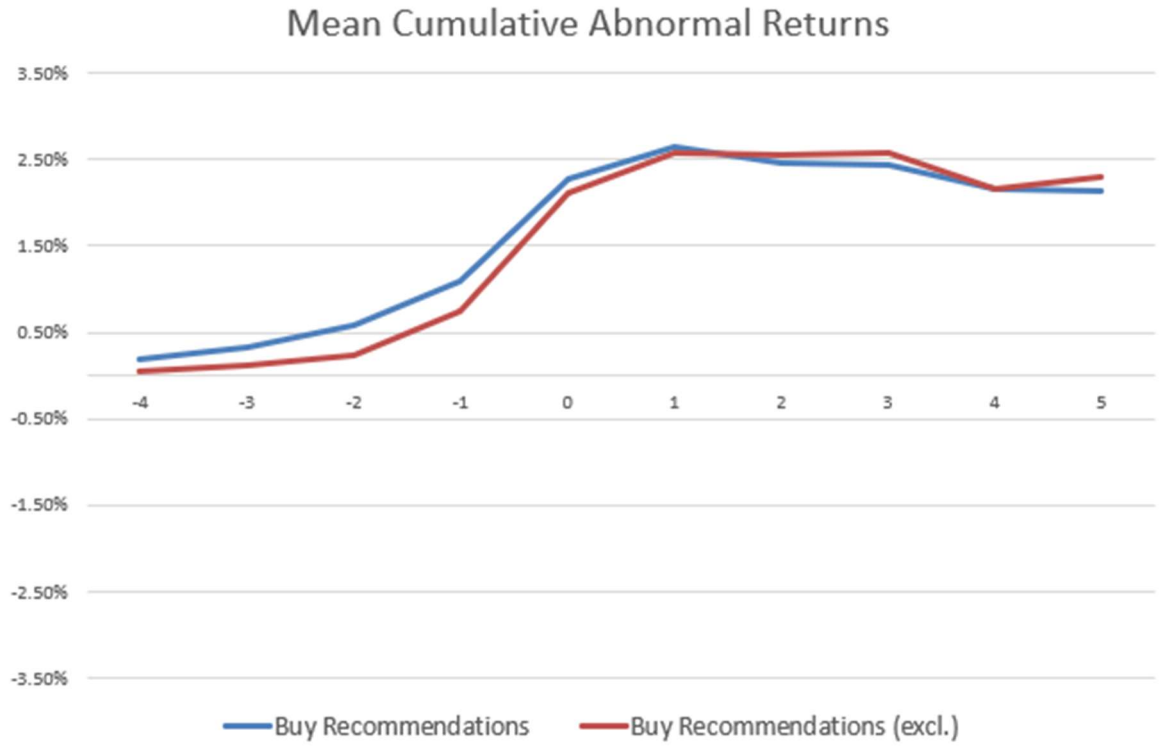

Figure 2. Mean CAR Comparison, Buy recommendations
Source: Author's own calculations

The $\overline{CAR}$ for the first study group has statistically significant results on the 1% level from τ = -1 to τ = 5 suggesting that the exclusions made for annual and quarterly reports lessen the possible $\overline{CAR}$ that would normally occur due to anticipation of the annual and quarterly report publications regarding buy recommendations. The $\overline{CAR}$ has only one result that is statistically significant from zero on the 5% level at τ = -2. The $\overline{CAR}$ for event date is 2.1% which is slightly less than from the second study group's, 0.17% units to be exact. Similar to the second study group's results for $\overline{CAR}$, the τ = 1 to τ = 3 retain a higher $\overline{CAR}$ and declines from the τ = 4 and τ = 5. These results suggest that there is investment value in the first study group when buying stocks according to buy recommendations that are not near to annual or quarterly reports.

3.2. Sell recommendations

Here the Table 5 represents the $\overline{AR}$ and the Table 6 the $\overline{CAR}$ for sell recommendations for the second study group which takes recommendations at face value. Similar to the buy recommendations the sell recommendations are statistically significant from zero from τ = -1 to τ = 2 at 1% level with the $\overline{AR}$ on the event day being the most substantial with a $\overline{AR}$ of -1.24%. At τ = 3 the $\overline{AR}$ is statistically significant on 5% level and at τ = -3 and τ = 4 at 10% level. The τ = -3 might be explained by a factor other than sell recommendations since it has a significance difference to the τ = -1 not to mention τ = -2 not being significant on any level tested. These results do suggest that short-selling when a sell recommendation is published should return a profit on average.

To get a proper view of the possible gain one would make short selling we must also take a look at the $\overline{CAR}$ as we did with the buy recommendations. Here it can be that the τ = -3 to τ = -2 are statistically significant at the 1% level yet interestingly τ = -1 is not significant at all. This could be explained by a factor occurring on one day prior to a sell recommendation with the data set that is so impactful it affects the τ = -1 in such harsh way. This could also be the other way around where the τ = -3 to τ = -2 are affected by something else than sell recommendations which mimics the desired outcome of this study. Even though there is some discrepancy with those dates, the event date stays consistently significant with the following days being also quite high on the negative returns. On the event date of $\overline{CAR}$ the return would be from the start of the event window -1.16% with the following days exceeding -2% and almost reaching -3% in the last day with $\overline{CAR}$

of -2.93%. These suggest investment value for group two that short selling a sell recommendation might yield AR on average.

Table 8. Mean AR, Sell recommendations, Author's own calculations

τ	Mean AR	t-stat.
-4	0.16%	1.484
-3	0.20%	1.820***
-2	0.16%	1.451
-1	-0.43%	(-)3.943*
0	-1.24%	(-)11.293*
1	-0.90%	(-)8.140*
2	-0.31%	(-)2.854*
3	-0.28%	(-)2.564**
4	-0.21%	(-)1.908***
5	-0.08%	(-)0.681
Significant at 1% (*), 5% (**), 10% (***)		

Source: Author's own calculations

Table 7. Mean CAR, Sell recommendations, Author's own calculations

τ	Mean CAR	t-stat.
-4	0.16%	1.484
-3	0.36%	3.304*
-2	0.52%	4.755*
-1	0.09%	0.812
0	-1.16%	(-)10.481*
1	-2.05%	(-)18.621*
2	-2.37%	(-)21.475*
3	-2.65%	(-)24.039*
4	-2.86%	(-)25.947*
5	-2.93%	(-)26.628*
Significant at 1% (*), 5% (**), 10% (***)		

Source: Author's own calculations

Table 6. Mean AR (exclusions), Sell recommendations, Author's own calculations

τ	Mean AR (excl.)	t-stat.
-4	0.27%	1.844***
-3	0.21%	1.424
-2	0.21%	1.415
-1	-0.18%	(-)1.202
0	-1.22%	(-)8.321*
1	-1.03%	(-)7.042*
2	-0.16%	(-)1.127
3	-0.48%	(-)3.310*
4	-0.18%	(-)1.246
5	-0.19%	(-)1.290
Significant at 1% (*), 5% (**), 10% (***)		

Source: Author's own calculations

Table 5. Mean CAR (exclusions), Sell recommendations, Author's own calculations

τ	Mean CAR (excl.)	t-stat.
-4	0.27%	1.844***
-3	0.48%	3.268*
-2	0.68%	4.684*
-1	0.51%	3.482*
0	-0.71%	(-)4.839*
1	-1.74%	(-)11.881*
2	-1.90%	(-)13.008*
3	-2.38%	(-)16.318*
4	-2.57%	(-)17.564*
5	-2.76%	(-)18.854*
Significant at 1% (*), 5% (**), 10% (***)		

Source: Author's own calculations

In this section the Table 7 represents the $\overline{AR}$ and the Table 8 the $\overline{CAR}$ for sell recommendations for the first study group which takes does take exclusions into account. With the first study group regarding the sell recommendations, we can see that the magnitude of the effects is very similar with the $\overline{AR}$ at $\tau = 0$ and $\tau = 1$. There is one more statistically significant result on the 1% level at $\tau = 3$ however it seems that it is explained by some other external event due it not being connected to previous days that are significant on the 1% level, and the $\tau = 2$, $\tau = 4$ and $\tau = 5$ are not significant at all in any level tested which further suggests that this is explained by something else thus making it an outlier. Similarly, the τ = -4 is only significant at 10% level and from τ = -3 to τ = -1 there

are no significant results from zero which suggest this is an outlier as well. However, the $\tau = 0$ and $\tau = 1$ of $\overline{AR}$ have consistently being significant on the highest level suggesting that there is investment value to them regardless of a sell recommendation is made near an annual or quarterly report or not.

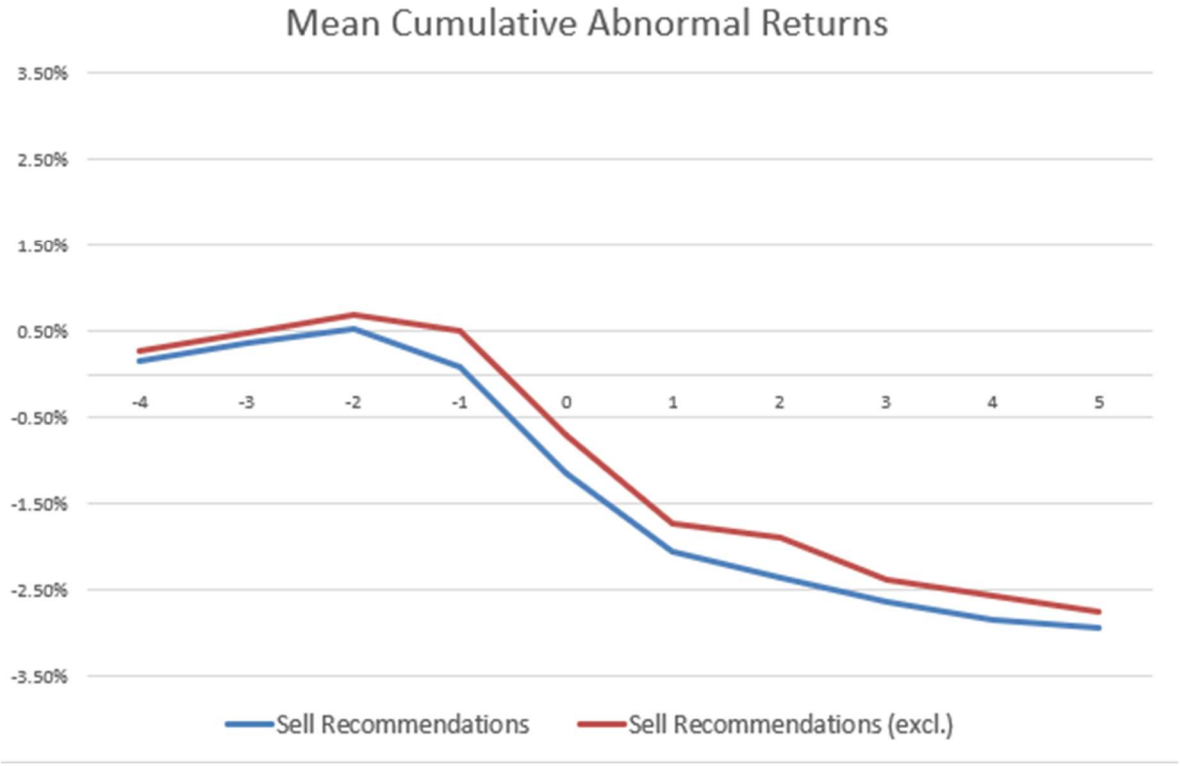

Figure 3. Mean CAR Comparison, Sell recommendations
Source: Author's own calculations

With the $\overline{CAR}$, the sell recommendations of group one are significant on the 1% level from τ = -3 $\tau = 5$, and τ = -4 only being significant on 10% level which is significantly less significant compared to the other days. If one would short sell a stock four days prior to a sell recommendation and hold it for the 10 days, they would receive an AR of 2.76% on average which suggest that there is investment value in sell recommendations for short selling stock. The $\overline{CAR}$ turns negative as soon as the event date occurs similarly the way it does with the second study group.

3.3. Buy recommendations post-event

The post-event period is from $\tau = 0$ to $\tau = 5$. Here we can see how the $\overline{CAR}$ differs between study group two (Table 9) and study group one (Table 10). If one would make an investment on the day of a buy recommendations publication, they would receive $\overline{CAR}$ of 1.82% on $\tau = 1$ and 1.54% on

τ = 5 when the recommendation is not near an annual or quarterly report. When the investment is done on the day of a buy recommendation that is near an annual or quarterly report, the $\overline{CAR}$ is 1.55% on τ = 1 and 1.04% on τ = 5. Every result is significant on the highest level tested (1%) for both study groups during the post-event period. Interestingly when a buy recommendation is done near an annual or quarterly report, the correction for stock prices on average seems more immediate and the $\overline{CAR}$ is also less when these reports are included compared to when the reports are excluded.

Table 10. Mean CAR post-event, Buy recommendations

τ	Mean CAR	t-stat.
0	1.18%	14.168*
1	1.55%	18.651*
2	1.37%	16.512*
3	1.34%	16.094*
4	1.06%	12.729*
5	1.04%	12.489*
Significant at 1% (*), 5% (**), 10% (***)		

Source: Author's own calculations

Table 9. Mean CAR post-event (exclusions), Buy recommendations

τ	Mean CAR (excl.)	t-stat.
0	1.35%	12.333*
1	1.82%	16.629*
2	1.79%	16.360*
3	1.83%	16.682*
4	1.40%	12.810*
5	1.54%	14.046*
Significant at 1% (*), 5% (**), 10% (***)		

Source: Author's own calculations

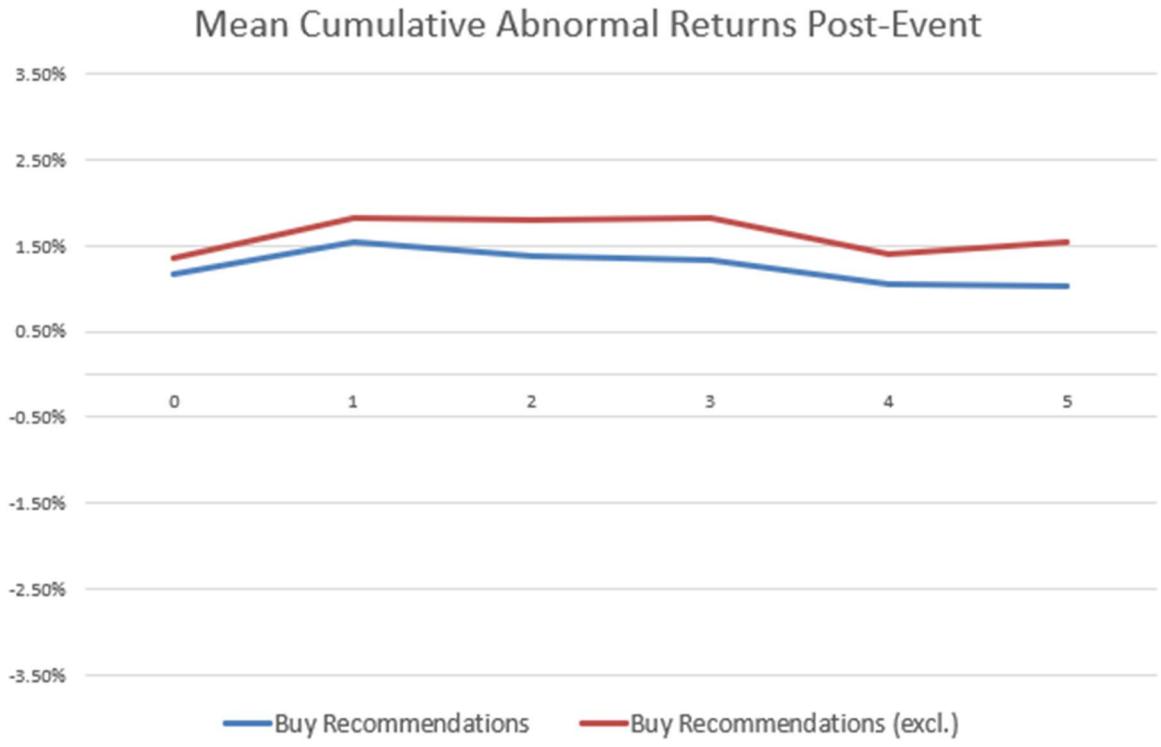

Figure 4. Mean CAR Comparison Post-Event, Buy recommendations
Source: Author's own calculations

This can be explained by the fact that these reports usually hold a lot of anticipation which can be seen in Figure 4 where the post-event for buy recommendations is illustrated for both study groups. In Figure 4 the study group one (Red) is consistently above the second study group (Blue) with higher $\overline{CAR}$ and compared to Figure 2 the post-event period has both red and blue closing into each other. These results do suggest that there is investment value when making an investment according to a buy recommendation on the event day in both study group scenarios with a higher possible $\overline{CAR}$ when executing the investment with the first study group conditions of the recommendation not being near any annual or quarterly reports of that particular company most likely due to anticipation leading to more imminent correction with the second study group.

3.4. Sell recommendations post-event

As mentioned before, the post-event period is from $\tau = 0$ to $\tau = 5$. Here Tables 11 and 12 represent the $\overline{CAR}$ for post-event period for study group two and one respectively regarding sell recommendations. Here every single result is significant in the highest level tested (1%) similarly to the post-event buy recommendations. The $\overline{CAR}$ does differ between the two study groups where the first study group having more negative results on average than the second study group as we can see in the $\tau = 5$ where the $\overline{CAR}$ is -3.02% for the second study group and -3.26% for the first study group suggesting that the recommendations that are not affiliated with any annual or quarterly reports bear larger magnitude of an effect although otherwise quite similar around the post-event period.

Table 12. Mean CAR post-event, Sell recommendations

τ	Mean CAR	t-stat.
0	-1.24%	(-)11.293*
1	-2.14%	(-)19.433*
2	-2.46%	(-)22.287*
3	-2.74%	(-)24.850*
4	-2.95%	(-)26.759*
5	-3.02%	(-)27.440*
Significant at 1% (*), 5% (**), 10% (***)		

Source: Author's own calculations

Table 11. Mean CAR post-event (exclusions), Sell recommendations

τ	Mean CAR (excl.)	t-stat.
0	-1.22%	(-)8.321*
1	-2.25%	(-)15.363*
2	-2.41%	(-)16.490*
3	-2.89%	(-)19.800*
4	-3.08%	(-)21.046*
5	-3.26%	(-)22.336*
Significant at 1% (*), 5% (**), 10% (***)		

Source: Author's own calculations

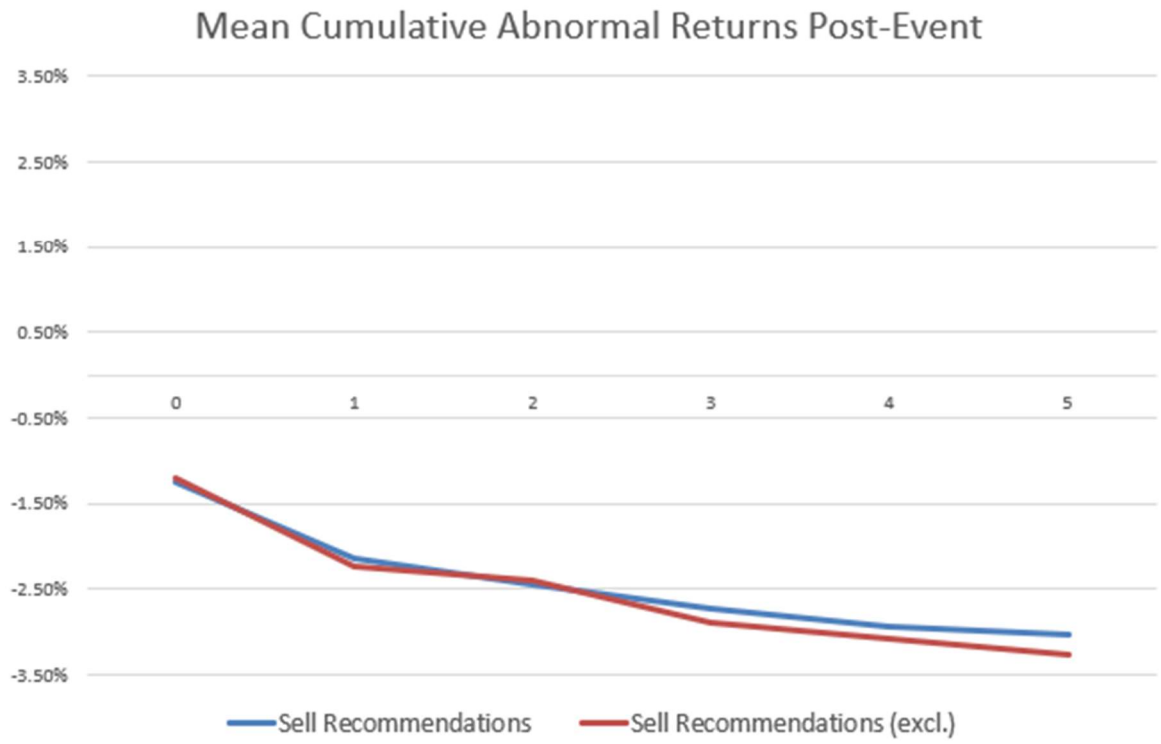

Figure 5. Mean CAR Comparison Post-Event, Sell recommendations
Source: Author's own calculations

In Figure 5 it is interesting to see how the $\overline{CAR}$ not only get closer to each other like in Figure 4 regarding buys recommendations but actually switch position i.e., blue is on top and red under compared to the event widow illustration on Figure 3 where they are the other way around during post-event period. This does suggest that sell recommendations made near an annual or quarterly report have less of an effect in the post-event period compared to the first study group where the affiliated reports are excluded. These observations do suggest that there is investment value for an investor if one would like to start short selling on the day of the publication of a sell recommendation in both scenarios. The recommendations where the reports are excluded do seem to have a stronger effect and thus more potential on average when investing during the post-event window established in this study.

3.5. Discussion

To support these findings, we can take a glance at previous studies. As Stickel (1995), Womack (1996) and Lidén (2006 and 2007) found that analysts are more susceptible to publish buy recommendations rather than sell recommendations, it can be noted in this study as well that percentage wise the second study group had 56.54% and 43.46% of buy and sell recommendations

respectively and similarly for the first study group there were 57% and 43% of buys and sells respectively. Although the ratios do vary between studies this can be simply justified by the difference between market, country, time period and other related factors, yet the underlying fact remains that analysts seem to be more careful with sell recommendations.

The findings of this study are supported by Stickel (1995), Womack (1996), and Barbel et al. (2001) since they also found significant abnormal returns for both buy and sell recommendations. These results do suggest investment value for an investment strategy involving buy and sell recommendations in short term where one buys according to a buy recommendation and short sells according to a sell recommendation even if the recommendation is published outside of an 11-day window of an annual or quarterly report. Interestingly, sell recommendations seem to have a greater effect on the development of a stock price compared to a buy recommendation since in post-event period a sell recommendation exceeds $\overline{CAR}$ of negative 3% where a buy just results in a positive $\overline{CAR}$ of 1-1.5% at τ = 5 which is around 3 to 2 times less than the effect a sell recommendation bear.

If efficient markets are assumed by the definition of Effcient Market Hypothesis by Fama (1965) the finding in this study do challenge the idea since significant results were found even tough all information should be available for public and nothing new is published by any analyst. Modern Portfolio Theory by Markowitz (1952) is also challenged since there could be an investment strategy involving strictly stocks recommended by analysts for short term gains.

CONCLUSION

This thesis was established to determine if recommendations set by analysts affect stock price movement in Nasdaq Helsinki -companies, and if there is investment value to these recommendations. The sample size included 111 companies from the Nasdaq Helsinki and a total of 1528 and 800 valid recommendations for study groups two and one respectively from years 2013 to 2022. Of these recommendations 864 were buys and 664 were sells for the second study group and for the first one 456 were buys and 344 were sells. For these recommendations, mean Abnormal Returns ($\overline{AR}$) and Cumulative Abnormal Returns ($\overline{CAR}$) were calculated while using the OMXH25 as the market model for comparison due it being relatively good representation of the Finnish market development. The event window consisted of 10 days where four days were prior the event and the five days were post-event, and an estimation period of 120 days from the event window. The results do show statistically significant results for all $\overline{CAR}$ post-event days regardless of the study group or the recommendation. Results for buy and sell recommendations is both study groups regarding the $\overline{AR}$ tended to be statistically significant on the 1% level at τ = -1 to τ = 2 on average. A sell recommendation was found to generate a higher percentage of gain (short sell) than a buy recommendation and with post-event observation alone almost two to three time the return at τ = 5 when observing the $\overline{CAR}$.

Establishing the research question of "*How do the different stock price predictions (buy/sell recommendations) set by analysts affect the movement of the stock prices on Nasdaq Helsinki?"* helped to create the hypotheses for this thesis. The meaning behind the research question was found by studying these two research hypotheses which resulted in the previously discussed outcomes. The hypotheses were presented in the theoretical framework since they were based on previous theories and studies on the topic. In this study the effects of recommendations were studied in a short-term manner to see if there are any immediate effects from the recommendations.

The results from this study did not lead to the rejection of the first hypothesis that "*Stock prices of Nasdaq Helsinki -companies are positively (negatively) affected by analysts' buy (sell) recommendations enabling abnormal returns on short-term period"*. Since the first hypothesis

cannot be rejected it means it can be seen as supporting evidence that analysts' recommendations on the Finnish market do have effect on the development of prices since the exclusion of critical financial reports did still bear significant results for both buy and sell recommendations during the event window.

The second hypothesis *"Magnitude of the effects caused by analysts' buy and sell recommendations are higher when recommendations are published near quarterly and annual reports"* can be rejected. Interestingly in general the magnitude of effect an analyst recommendation has is bigger with recommendations that are not affiliated with an annual or quarterly report. This could be explained by anticipation of the market to a critical report before the actual event date.

These results would suggest an investment strategy for the Finnish market where investors buy and short sell according to recommendations in short term. This sort of strategy seems to result in relatively good short-term gains however it must be noted that no transaction fees are taken into account. Naturally the gains would be higher the lower the transaction fees are. Also, it is extremely hard to predict the future thus this means one's own research should not be neglected even if analysts seem to be capable of making good analysis and predictions in the short term. This study did not take into account target price that was accompanied with the recommendation nor did this study use multiple analyst houses' recommendation. The only analyst house that was used was Inderes due to it having made most of the recommendations and the different recommendation made by others used different scales to evaluate their recommendations which would lead into discrepancy if they would be used without a proper conversion. Some other external events were not taken into account such as political issues affecting specific companies etc., and also strong sells and buys were treated equal to regular sell and buy recommendations. All of these limitations of the study might result in different outcomes which leaves room to future studies regarding the effects of analyst recommendations in Nasdaq Helsinki.

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APPENDICES

Appendix 1. Link to dataset

Recommendations data (1).xlsm

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