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The effect of Investor Attention on Stock Returns in the Nordics

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ABSTRACT

I use google search volume to measure the effect of attention on stock returns in the Nordics (Finland, Denmark, and Sweden). Using data on stock returns and Google search volume from 2018 to 2023 on the 72 largest and most traded companies in Finland, Sweden, and Denmark. I regress the google search volume data on the stock returns and find no significant explanatory value. This suggests that the Nordic stock market is small enough that there may not be the same search problem as in bigger markets.

Keywords: Investor Attention; Nordics; Returns

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CHAPTER 1 Introduction

In January of 2021 the GameStop stock soared to extreme values, mainly due to the attention of retail investors the stock had gotten on the social media platform Reddit (*The Economist*, n.d.). While this is an extreme example it illustrates the fact that retail investors attention can have an effect on stock prices. Traditional asset pricing theory relies on the assumption that information is constantly incorporated into prices, this would require investors to constantly pay attention to assets and update their believes. In reality however investors, especially retail investors, have limited time and energy to allocate to researching stocks, they can't then research all stocks available and will then generally only buy stocks that catch their attention. This creates an upward price pressure on stocks that have caught investors' attention. This effect is only present on the buy side, as retail investors generally don't short stocks and will only sell stocks, they already own (Barber & Odean, 2008). With google as the consistently most used search engine, it seems logical that investors, especially retail investors, will use it to find information on the companies they intend to invest in. To capture and measure investor attention Da et al. (2011) use google search volume index, in this thesis I intend to study the relationship between Google search volume and stock returns, in the Nordic (Finland, Sweden, and Denmark) market.

The relationship between attention and stock prices is one that has been studied over and over again, a notable one is the paper by Barber and Odean (2008) who find that individual investors are net buyers of stocks that have recently caught their attention. They do so buy regressing several measures that try to capture investor attention, such as news coverage and trading volume, on buy and sell imbalances of individual investors. In studying advertisement as a measure of attention Grullon et al. (2003) find that firms that advertise have higher liquidity and a bigger ownership base, indicating that investors tend to buy stocks that they are familiar with and draw their attention. Da et al. (2011) take this investigation further by proposing a more direct measure of investor attention namely google search volume, they regress search index measures on future returns, in the American market. Both Da et al. (2011) and Barber and Odean (2008) find that investor attention drives up stock prices in the weeks after the attention is observed, but that there later is a return reversal.

Previous research by Da et al. (2011) look at google search volume effect on the American stock market between 2004 and 2008. Some researchers have also looked at the relationship between google search volume and stock prices in Vietnam (Duc et al., 2024) and India (Swamy & Dharani, 2019). I intend to replicate this relationship in the Nordic (Finland, Sweden, Denmark) stock market (Nasdaq Nordic) during the years 2018 to 2023. The Nordic stock markets are an interesting setting as the markets is much smaller than the American one. However, the markets still contain multinational companies such as Nokia and Kone (global leader in elevator and escalators) on the Finnish market

(Nasdaq Helsinki), Novo Nordisk on the Danish market (Nasdaq Copenhagen), and Hennes and Mauriz (H&M) and Handelsbanken on the Swedish market (Nasdaq Stockholm). The period I intend to study is a longer one and one that starts four years later than the one studied by Da et al. (2011) ends, technology has come a far way since then and google users have increased, allowing for google search volume to be a better estimate. Thus, the question I intend to study in this thesis is: *How does attention (Google search volume) affect stock prices, specifically in the Nordics (Finland, Sweden, and Denmark)?*

I will focus my research on the three Nordic courtiers (Finland, Sweden, and Denmark) that are members of the European Union (from now on EU), the stock markets in question are Nasdaq Helsinki, Nasdaq Stockholm, and Nasdaq Copenhagen. The time frame of the sample are the years 2018 to 2023, observations will be weekly. To study these markets, I will use the 76 stocks in the OMX Helsinki 25, OMX Copenhagen 25, and OMX Stockholm 30 indexes, these track the performance of the most traded stocks on each of the stock markets. The data on these stocks will be collected form LSEG Datasteam. The data on google search volume will be collected from Google Trends which reports a search volume index (SVI). SVI is the weekly percentage of search volume relative to the max volume. Following Da et al. (2011) I will collect several different SVI, I will collect the SVI for the company name and company name followed by "osake" (the word for stock/share in Finnish) or "aktie" (the word for stock/share in both Danish and Swedish), in order to measure attention towards the company itself and towards the company's stock, respectively, the google search data will be geographically restricted to Finland, Sweden and Denmark. This will result in a panel data set. I will run both a fixed effects regression and a Fama-MacBeth (1973) regression on the data with the future returns as the dependent variable, and different SVI measures as the independent variable.

I expect that since the Nordic stock market has a lot less listed companies, the effect of attention might not be as strong as in say the American market. Since investors do not face a completely unrealistic set of choices, it is actually possible to know most companies on the market and thus attention may not be that big of a price driver. On the other hand, I expect that search volume may still have a significant effect on Nordic stock market prices as google is the most popular search engine (Statista, 2024). Thus, I expect that that the results produced by Da et al. (2011) are generalizable to the Nordic market.

Despite my initial expectations, I do not find a significant relationship between Google search volume and stock returns in the Nordics. Contradicting the results found by Da et al. (2011) and Barber and Odean (2008) on the American stock market. This may be due to the small size of the Nordic market, reducing the search problem faced by investors and thus the upward price pressure hypothesised by Barber and Odean.

The reminder of this thesis is structured as follows. Chapter 2 discusses previous literature and research on investor attention and stock returns, Chapter 3 introduces the sample used in the analysis, Chapter 4 discusses the methodology and analysis, Chapter 5 introduces the results and discusses them in relation to previous results on the topic, and Chapter 6 provides a summary and conclusion to the thesis. Additional material can be found in Appendixes A and B.

CHAPTER 2 Theoretical Framework

2.1 the Nordic Stock Market

Stock performance, according to traditional financial theory, should be a measure of the company value. This relies on the assumption of rational investors, that investors will only invest if the value of the company is the same or larger than the price reflected in the share. This thesis explores the Nordic (Sweden, Finland, and Denmark) stock market and its stocks performance. The three Nordic stock markets in question are characterized as small but developed markets home to some large and global companies such as H&M (Hennes and Mauritz) in Sweden or Kone in Finland. Combined the Swedish, Finnish and Danish Nasdaq has 602 stocks (*Shares - Share Prices for All Companies Listed on NASDAQ OMX Nordic - Nasdaq*, n.d.). To measure the stock performance, the return of the 25 (Finland and Denmark) or 30 (Sweden) biggest and most traded stocks for each of these markets will be used, these are the stocks on indexes that follow the market performance.

2.2 Investor Attention

Websters dictionary defines attention as "the act or state of applying the mind to something" (*Definition of ATTENTION*, 2024). In this thesis I will look into investor attention, so to what stock/company an investor decides to apply their mind to. Investor attention is a limited recourse as it requires time and effort, thus one cannot pay attention to every stock on the market. Investor attention is not quantifiable; however, a popular measure of attention is Google search volume, which is an index that measures how much a certain term is typed into the search engine Google.

"A simple model of capital market equilibrium with incomplete information" (Merton, 1987) is one of the first studies to incorporate investor attention, the author takes into account the fact that investors may only be aware of a subset of stocks. This would then affect the valuation of these stocks, as information would only be incorporated into the stock price as investors pay attention to it. Merton (1987) challenges the common assumption of complete information, his model still assumes rational investors, arguing that rational investors cannot act rationally on the information if their attention is not directed at said information. While later models on the subject of investor attention does not include the assumption of rational investors Merton (1987) laid the ground work for research into the subject.

Odean (1999) points out that investors face a search problem when choosing investments, as they do not possess the time or resources to go over every option available. This leads to many investors

limiting their search to investments that have caught their attention. Barber & Odean (2008) argue that while rational investors may be aware of the fact that if information or a stock has caught their attention, it has undoubtedly caught others attention as well. Manny investors are still overconfident in the quality of the information they have acquired, these investors may then overvalue the information that have caught their attention (Odean, 1998b).

Investor attention is not something that is easily measured, as it is not quantifiable. Researches have used several different measures both direct and indirect to try use as proxies. The research often focuses on retail investors attention, as they tend to have less time and energy to use on researching stocks and thus less attention to pay out to different stocks (Barber and Odean, 2008). Barber and Odean (2008) develop three indirect measures for investor attention, their main measure is news mentions of stocks, with the idea that when a company appears in the news it attracts the attention of potential investors. Another measure of attention is extreme returns, with the motivation that whatever caused the extreme returns likely also caught the investors' attention. Abnormal Trading volume is also used by Barber and Odean (2008) and others as an indirect proxy for investor attention, as high trading volume most likely indicates that lots of investors paid attention to said stock at said moment. Other researchers (Chemmanur & Yan, 2019; Grullon et al., 2004) use advertising as to proxy for attention, as adds may not only attract costumers' attention but also investors. More direct measures of attention involve using search engine data to measure attention that investors pay to stocks, Da et al., (2011) use Google search volume index and Zhang et al. (2013) use a Baidu Index in the Chinees market. Ben-Rephael et al., (2021) develops a measure using Bloomberg activity to measure institutional investors' attention.

2.3 Relationship between Investor Attention and Stock returns

Barber and Odean (2008) study investor attention on the buying behavior of investors, using data from several different kinds of brokerages, they find that individual investors are net buyers of attention-grabbing stocks. This is evidence in support of their hypothesis, that given the fact that investors face thousands of options when choosing what stocks to buy, and cannot with limited time and recourses research them all, investors end up buying stocks that have caught their attention. But investors will not face the same problem when selling, unless they decide to short sell. This results in an upward pressure in the stock's price as a result of the attention. Giving way to a market inefficiency as the prices no longer only reflect the all the information of a company available on the market, but who pays attention to this.

Da et al. (2011) study the effect of investor attention on stock returns, using google search volume as a measure for investor attention, their sample consists of Russell 3000 stocks from 2004 to 2008. They find that after an increase in Google SVI the stock price would increase in the following two weeks, followed by a return reversal within a year. This further proves the theory mentioned by Barber and Odean (2008). Chen, (2017) and Zhang et al., (2013) finds similar results as Da et al. (2011) when studying the same relationship globally and in China respectively (Zhang et al. (2013) use the baidu index instead of google). The relationship between google search volume has also been studied in several Asian markets such as Vietnam (Đức et al. (2024)) and India (Swamy and Dharani (2019b)) both find results in line with the ones found by Da et al. (2011) indicating that the results are applicable internationally, at least in Asia.

Other researchers also study investor attentions effect on stock prices using other measures of attention. Chemmanur and Yan (2019) use advertising as a measure of attention and find that stock prices increase in the year of advertising, followed by a decrease as the attention wares of. However, Focke et al., (2020) questions the relationship between advertising and stock returns after not finding significant increases in short term stock returns after advertising, arguing that previous results were due to reverse causality.

Given the fact that the Nordic market is much smaller (602 stocks in total on the Finnish, Swedish and Danish markets) than the American stock market, where Da et al. (2011) conducted their research, one could assume that investors don't face the same search problem as when dealing with thousands of stocks. Thus, the same upward price pressure would not be as present. However, given that similar results have been found in other courtiers as well and the fact that google is the most popular search engine (*Global Search Engine Desktop Market Share 2024 | Statista*, n.d.) one would assume that it is still a valid measure for attention. And while 602 stocks are not a lot, it is still realistic that individual investors face a search problem and do not pay attention to them all. Thus, I assume that the results of Da et al. (2011) are applicable to the Nordic market.

CHAPTER 3 Data

The sample consists of 72 Nordic stocks, and is collected during the time period January 2018 to January 2023. The stocks included are the ones on the OMX Helsinki 25 (OMXH25), OMX Copenhagen 25 index (OMXC25) and OMX Stockholm 30 index (OMXS30), all three indexes are on the Nasdaq Nordic, these indexes all represent the largest and most traded stocks on each of the exchanges (*Overview for OMXC25*, n.d.; *Overview for OMXH25*, n.d.; *Overview for OMXS30*, n.d.). I have chosen to look at these three Nordic countries (Finland, Sweden, and Denmark) and excluded Norway and Iceland, due to the fact that neither of these two are in the European Union, this allows for a more homogenous sample. Two stocks are listed on multiple indexes, this is Nordea Bank Abp and Telia Company, as to not include these stocks multiple times in the sample Nordea Bank Abp and Telia Company are only included in the sample for Stockholm exchange, as Sweden is the biggest in terms of population and thus has the biggest financial market. Two stocks in the sample are listed in the indexes for both an A and B series, A.P. Møller – Mærsk on the OMXC25, and Atlas Copco on the OMXS30, the only difference in A and B series of shares is voting rights (*FAQs | A.P. Møller - Mærsk A/S*, n.d.; *Frequently Asked Questions - Atlas Copco Group*, n.d.) for both of these stocks only the series with less voting rights will be included to more capture retail investors preferences. The stocks Mandatum and Demant are not included in the sample due to problems with data availability.

Return is the weekly stock return of stock *i*, the variable *Return* is cross-sectionally demeaned, making the regression intercept zero. *Return* is collected form LSEG Datastream, for N = 72 stocks and t = 261 weeks, resulting in 18 767 observations, across 3 courtiers (Finland, Sweden and Denmark).

SVI (Search Volume Index) is collected from Google Trends (*Google Trends*, n.d.) and measures search volume for a certain search term. The index goes for 1 to 100, and is normalized so 100 is the max search volume for the chosen period and location (*Basics of Google Trends - Google News Initiative*, n.d.). SVI is measured for two different search terms, in order to capture only stock related searches and to measure those related to the entire company. *SVI Stock* which measures the search volume of the name of the company followed by the term for stock in each language of the country that the stock is listed on, in Finnish “Osake”, in Swedish and Danish “Aktie”, for example for the elevator company Kone “Kone osake” and for the bank Nordea Bank Abp “Nordea Aktie”. And, *SVI Company* which measures the Google Search volume index for just the company name. SVI is measured in weekly intervals over the five-year sample period for each of the stocks in the sample, resulting again in t = 259 weeks and N = 72 companies across three countries, and in total 18 648 observations for each of the two *SVI* variables. To further examine the effect of abnormal attention on stocks on its return, following the research of Da et al. (2011), abnormal SVI (*ASVI*) is constructed for

each of the SVI variables. *ASVI* is defined as the natural logarithm of the current SVI minus the natural logarithm of the last eight-week median SVI, abnormal SVI is also standardized.

Other control variables used are *Market Cap*, measuring the Market Value of the stocks at each time. *Volatility* measuring historical volatility. *Trading volume* measuring the turnover volume of each stock. *Market Cap*, *Trading Volume*, and *Volatility* are all cross-sectionally standardized.

Since all variables are either standardized or demeaned all means are zero. the demeaned value of return has a range of point five to negative zero point thirty-seven. The standardized values of *ASVI Company* ranges from almost ten to almost negative seven, while the standardized values of *ASVI Stock* rages from about eight to negative six.

Table 3.1
Summary Statistics

Summary statistics of demeaned return, standardized abnormal Google search volume index for company, and standardized abnormal Google search volume for company followed by the world for stock in the appropriate language.

Variable	Mean	Standard devianton	Max	Min	Observation
Return	0	0,049	0,507	-0,368	18 767
ASVI_Company	0	0,626	9,931	-6,835	18 083
ASVI_Stock	0	0,998	8,253	-6,003	18 083

CHAPTER 4 Method

To analyze the collected data, a panel data set with two dimensions; weeks and stock/company, an OLS panel data regression using a fixed effects model will be used. Panel regression allows for both cross sectional and time series elements of the data, this is crucial for the analysis. The fixed effects model allows for separate intercepts for each of the companies, but assumes that the effects are the same across companies (see Appendix A for Hausman test to determine whether to use fixed of random effects). The regression will include lagged values of the independent variable allowing for delayed reaction of the independent variable on the depended, in order to decern how long the effect of attention on stock returns lasts. Regressions will be run for both of the different SVI variables (*ASVI Company*, and *ASVI Stock*), the regressions included control variables and lagged values of the relevant SVI variable. Standard errors are clustered on the company level, to adjust for within cluster error correlation and heteroskedasticity. As a robustness check the regressions will also be run separately for each of the countries (see Appendix B).

Following Da et al. (2011) the analysis is also done using a Fama & MacBeth (1973) cross-sectional regression, this model accounts for time-specific economy-wide shocks. The Fama-MacBeth regression is a two-step regression, step one is individual time series regressions for each of the companies and step two then cross-sectional regressions for each of the time periods. Newey-West heteroscedasticity and autocorrelation robust standard errors with five lags are estimated to address issues with heteroscedastic and serial correlation within the error term.

CHAPTER 5 Results & Discussion

The model used in the first analysis is a Fixed effects Regression and in the second Fama-MacBeth (1973) (From now on FMB) cross-sectional regression. All independent variables are cross sectionally standardized, all *ASVI* and *SVI variables* are measured in natural logarithms. *Return* is the depended variable in all regressions. The results should be interpreted as such, one standard deviation increase of the *SVI variable* leads to a percentage increase in *Return* by its coefficients amount. The control variables should also be interpreted as one standard deviation change. The fixed effect regressions results are presented in Table 5.1 and the FMB results are presented in Table 5.2, three regressions for both of the SVI variables (*ASVI Company* and *ASVI Stock*) have been run, each with different lags of the SVI variable, one, two, or three weeks.

5.1 Results

Table 5.1.1
Fixed Effects regression, Abnormal Search Volume and log Returns

Standard errors are reported in parenthesis, lags of the independent variable ASVI are reported at the top of the model, which independent ASVI variables is used is reported at the top of the table; Fixed effects regression with weekly observations per company. Demanded Return is the depended variable, the independent variables are standardized abnormal search volume as well as control variables. Standard errors are clustered according to company; * p<0,10; ** p<0,05; *** p<0,01.

	ASVI Company			ASVI Stock		
	Week 1 (1)	Week 2 (2)	Week 3 (3)	Week 1 (4)	Week 2 (5)	Week 3 (6)
ASVI	0,001	-0,001	-0,000	0,001**	-0,000	-0,000
	(0,001)	(0,001)	(0,001)	(0,000)	(0,000)	(0,000)
Volitility	-0,001	-0,001	-0,001	-0,001	-0,001**	-0,001*
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
Log MarketCap	-0,003***	-0,003***	-0,003***	-0,003***	-0,003***	-0,003***
	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
Turnover Volume	0,003***	0,003***	0,003***	0,003***	0,003***	0,003***
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
Constant	0,000	0,000	0,000	0,000***	0,000***	0,000
	(0,000)	(0,000)	(0,00)	(0,000)	(0,000)	(0,00)
Observations	17 993	17 922	17 851	17 993	17 922	17 851
R^2	0,010	0,010	0,010	0,011	0,010	0,010

Table 5.1.2
FMB regression, Abnormal Search Volume on log Returns

Standard errors are reported in parenthesis, lags of the independent variable ASVI are reported at the top of the model, which independent ASVI variables is used is reported at the top of the table; Fama-MacBeth regression with weekly observations per company. Demanded Return is the depended variable, the independent variables are standardized abnormal search volume as well as control variables. The standard errors are computed using Newey-West (1987) formula with five lags; * p<0,10; ** p<0,05; *** p<0,01.

	ASVI_Company			ASVI_Stock		
	Week 1 (1)	Week 2 (2)	Week 3 (3)	Week 1 (4)	Week 2 (5)	Week 3 (6)
ASVI	0,001	-0,002**	-0,001	0,000	-0,001*	0,000
	(0,001)	(0,001)	(0,001)	(0,000)	(0,000)	(0,000)
Volitility	-0,001	-0,001*	-0,001*	-0,001*	-0,001**	-0,001**
	(0,001)	(0,001)	(0,001)	(0,001)	(0,000)	(0,001)
MarketCap	-0,004***	-0,004***	-0,004***	-0,004***	-0,004***	-0,004***
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
Turnover Volume	0,001	0,001	0,001	0,000	0,001	0,001
	(0,001)	(0,001)	(0,001)	(0,000)	(0,001)	(0,001)
Constant	0,000	0,000	0,000	0,000	0,000	0,000
	(0,000)	(0,001)	(0,001)	(0,000)	(0,000)	(0,000)
Observations	17 993	17 922	17 851	17 993	17 922	17 851
R^2	0,143	0,143	0,139	0,134	0,138	0,135

The R-squared of the fixed effects models are around 0,010, meaning that the model explains about 1% of the variance of returns in Nordics. While the R-squared in the FMB models is above 0,134 for all models, indicating that the model explains at least 13,4% variance in *Returns*. Colum one and two in Table 5.2 have the highest R-squared and thus the highest explanatory value, in these models the one and two weeks ago abnormal search volume index of a company's name is regressed on the log returns of said company.

Mostly, the coefficients of each of the *ASVI variables* not significantly different from zero, however when regressing the one week ago *ASVI Stock* (Table 5.1 Column 4) using the fixed effects model, the effect is significantly different form zero at the five percent level, meaning that there is a less than five percent probability that the real coefficient is equal to zero. When regressing the two-week lag of *ASVI Company* on *Return* (Table 5.2 Column 2) an effect, that is significantly different from zero at the five percent level, is also observed. However even the results that are statistically significantly different from zero are very small, for example Table 5.1 Column 4 when regressing the one-week lag of *ASVI Stock* on *Return* the effect is significantly different form zero but the coefficient is 0,001 meaning a one standard deviation increase in *ASVI Stock* leads to a 0,1-percentage change in *Return*. While that effect may be statistically significant one cannot consider it economically significant. A robustness check is conducted (see Appendix B) where the regression is run for each of the three countries separately, the results are still similar across countries. Thus, based on this analysis, one can conclude that Google search volume does not have an explanatory value over the stock returns of the Nordics.

5.2 Discussion

The results found in this thesis are not in line with the results found on the American market by Da et al. (2011), they found that an increase in *ASVI* predicted an increase in returns in the following two weeks. And thus, support for the hypothesis of Barber and Odean (2008), saying that investor attention leads to an upward price pressure. In this thesis I found no evidence that investor attention would lead to an increase in returns in the Nordics. There are several reasons this may be the case.

The hypothesis put forth by Barber and Odean (2008) is based on the fact that individual investors face a choice of thousands of stocks, making it impossible to pay attention to all. Leading to investors buying the stocks that have caught their attention, thus making investor attention led to an upward price pressure. However, the Nordic (Sweden, Finland, and Denmark) market only has a total of 602 stocks, making it much easier to pay attention to a bigger share of the market. Both Barber and Odena (2008) and Da et al. (2011) samples consist of American stocks. Perhaps the fact that no effect was found in this papers analysis on the Nordic market is because of the fact that the market is so small that the price pressure hypostasized by Barber and Odean (2008) is not present.

One factor that may also affect the results in this analysis is the fact that such a small sample was used of only 72 stocks, while Da et al. (2011) used a sample of Russell 3000 stocks. A bigger sample would have allowed for more relatively unknow stocks that may have been more affected by attention. A bigger sample for the Nordic market was not possible due to liquidity constraints and the size of the Nordic markets, this may lead to less reliable results.

Factors not explored in this thesis, but that may have an effect on the effect of investor attention on returns, are behavioral factors. For example, cultural differences may play a role in how individuals make investment decisions, or the way individuals do their stock research. As well as the share of retail investors in the Nordics versus the United States may affect the results or the amount of the population that outsource their investment decisions, as Barber and Odena (2008) found that the price pressure is an effect produced by retail investors, not institutional. All of these topics would be interesting topics to explore in further research.

The results of this analysis are interesting. The hypothesis set forth by Barber and Odean (2008), supported by the results of Da et al. (2011) provide evidence of a market inefficiency, in the sense that attention should not determine returns, as it is not a reflection of the company's performance. However, the results of this analysis provide no evidence of such an inefficiency in the Nordic stock market. As investors on the Nordic market may actually be able to prosses a bigger share of the information available and thus make more informed investment decisions.

CHAPTER 6 Conclusion

This thesis explores the relationship between investor attention, measured in Google search volume, and stock returns in the Nordics (Finland, Sweden, and Denmark). Previous research focused on the United States have found that due to the huge set of options in the American stock market, investor attention has a positive short-term effect on stock return. The Nordics are an interesting stetting to explore these results due to the smaller yet developed stock market. So, the question studied in this thesis is "*How does attention (google search volume) affect stock prices, specifically in the Nordics (Finland, Sweden, and Denmark)?"*

The sample analyzed in this thesis consists of the 72 most traded stocks on the Finnish, Swedish, and Danish stock markets, and the search volume of each stocks name and each company's name followed by the word "stock" in the corresponding language, in order to capture attention towards the company as well as the stock of the company. During the timeframe of January 2018 to January 2023. The lagged values of search volume were then regressed on the stock returns. I found that, in regards to this analysis, google search volume has no meaningful explanatory value for stock returns.

This thesis concludes that investor attention may not be an explanatory factor when it comes to stock returns in the Nordics. This implies that due to the smaller Nordic market, investors do not necessarily face the same huge set of options as in bigger markets, reducing the effect of investor attention on stock prices. However, the reasons for this should be examined further.

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APPENDIX A Hausman Test

In order to decern weather to use a Fixed or Random effects model a Hausman Test was run. Under the null hypostasis the covariance of independent variable and the error term for each observation on the individual level is equal to zero, the random effects model is more efficient yet both random and fixed effects are appropriate. Under the alternative hypostasis the fixed effects model is more appropriate. The Hausman test is a F-test and the distribution of the critical values follows the chi-squared distribution. For both variables *ASVI Stock* and *ASVI Company*, the Chi-sqared values produced where negative, which is not appropriate for the test. Since fixed effects are appropriate in both cases fixed effect where used.

APPENDIX B Robustness Check

As a robustness check the one-week lag of *ASVI Stock* was regressed on *Return* using both the fixed effects regression and the FMB regression, for each of the three countries in the sample, Finland, Sweden, and Denmark.

Table B.1
Robustes check, Country regressions, ASVI and Returns

Standard errors are reported in parenthesis, the method used is reported at the top of the table, the columns indicate the courtiers for which the regression was run; Demanded Return is the depended variable, the independent variables are standardized abnormal search volume as well as control variables, the independet varaiable *ASVI Stock* is lagged by one week. Fixed effects regression with weekly observations per company, standard errors are clustered according to company Fama-MacBeth regression with weekly observations per company. The standard errors are computed using Newey-West (1987) formula with five lags; * p<0,10; ** p<0,05; *** p<0,01.

	FMB			Fixed Effects		
	Finland	Sweden	Denmark	Finland	Sweden	Denmark
1 Week ago ASVI_Stock	0,001	-0,001	-0,001	0,003***	0,000	0,001
	(0,001)	(0,001)	(0,001)	(0,001)	(0,000)	(0,001)
Volitility	-0,001	-0,000	-0,002*	-0,001*	-0,000	-0,001
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
MarketCap	-0,003***	-0,003***	-0,004***	-0,003***	-0,002***	-0,003***
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
Turnover Volume	0,001	0,002*	0,001	0,001	0,003***	0,002
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)	(0,002)
Constant	-0,001	0,000	-0,001	0,000***	0,000	0,000
	(0,002)	(0,002)	(0,002)	(0,000)	(0,000)	(0,000)
Observations	5 461	7 232	5 229	5 482	7 261	5 250
R^2	0,275	0,250	0,307	0,020	0,010	0,007

In the FMB regression we observe similar effects across each of the countries, none of the coefficients for the *ASVI Stock* are significantly different form zero. The R-squared has dabbled form 0,134 to around 0,275 when splitting the countries apart, indicating that the effect is more pronounced within countries.

When studying the results of the Fixed effects model, its notable that only the coefficient for *ASVI Stock* in the model for Finland is significantly different from zero and three times bigger than the one in the model using all countries together (0,001), the R-squared for this model is also almost double than the one in the original model (0,011(Table 4.1 Column 4) to 0,020 (Table B.1 Column 4)). However once again while these numbers are statistically significant, they are such small numbers that they do not matter economically. So, one can consider the models similar across countries.