STOCK MARKET REACTION ON DIVIDEND ANNOUNCEMENTS: EVIDENCE FROM NASDAQ NORDIC

Lappeenranta–Lahti University of Technology LUT

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ABSTRACT

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Stock market reaction on dividend announcements: Evidence from Nasdaq Nordic

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90 pages, 12 figures, 13 tables and 10 appendices

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Keywords: Dividend announcement, Abnormal returns, Dividend, Market cap, Event study

This thesis researches the short-term stock market reaction on different dividend change announcements during 2018−2022 in Nasdaq Nordic. Data consists of 977 dividend announcements by 253 firms, including 581 dividend increase announcements, 172 constant dividend announcements and 224 dividend decrease announcements. The focus in this study is on analysing stock price reaction and trading volume responses separately on different dividend announcements using event study methodology. In addition, this thesis investigates whether the stock market reactions on the dividend announcements are related to market capitalization of announcing firms.

The results show that dividend announcements have an abnormal effect on stock returns but the magnitude of the change in stock prices differs between the announcement types. The findings suggest that any form of dividend change announcement reflects to the market as increase in trading volume regardless of the direction of the change. The results also show that there are significant differences between Nordic countries and in the reactions between the firms of different size. The findings show that smaller firms have more pronounced reactions on the dividend announcement news compared to larger firms showing higher CAARs and CAAVs for mid-cap firms compared to large-cap firms. Overall, the results of this study support the informational content of dividends and suggest that investors can earn abnormal returns upon the announcements.

TIIVISTELMÄ

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Osakemarkkinareaktio osinkoilmoituksiin: tutkimus Nasdaq Nordic markkinoilla

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Professori Eero Pätäri ja Apulaisprofessori Sheraz Ahmed

Avainsanat: Osinkoilmoitus, Epänormaalit tuotot, Osinko, Markkina-arvo, Tapahtumatutkimus

Tämä tutkimus tutkii lyhytaikaista osakemarkkinareaktiota osinkomuutosilmoituksiin 2018–2022 Pohjoismaisilla markkinoilla. Tutkimuksessa käytetty data koostuu 253 yrityksen ilmoittamista 977 osinkoilmoituksesta, sisältäen 581 osingon kasvuilmoitusta, 172 muuttumatonta osinkoilmoitusta ja 224 osingon laskuilmoitusta. Tutkimuksessa tutkitaan osakekurssireaktiota ja kaupankäynnin määrän muutoksia ilmoituksien ympärillä tapahtumatutkimuksella. Tutkimuksessa tutkitaan myös eroavatko osakemarkkinareaktiot yritysten välillä pohjautuen niiden markkina-arvoon.

Tulokset osoittavat, että osinkoilmoituksilla on merkittävä vaikutus osakekursseihin, mutta vaikutuksen suuruus eroaa ilmoitustyyppien välillä. Tulokset osoittavat myös, että kaikilla kolmella osinkoilmoituksella on epänormaali positiivinen vaikutus kaupankäynnin määrään ilmoituksien ympärillä. Tutkimus osoittaa, että Pohjoismaiden tuloksien välillä on eroa ja näyttää, että tulokset eroavat yritysten välillä pohjautuen niiden markkina-arvoihin. Tuloksien mukaan pienemmillä yrityksillä on huomattavampi reaktio osinkoilmoituksiin verrattuna suurempiin yrityksiin. Kaiken kaikkiaan tulokset tukevat aiempaa tutkimusta ja teoriaa osinkoilmoitusten informatiivisesta vaikutuksesta osakemarkkinoilla ja osoittavat, että osinkoilmoitusten ympärillä on mahdollista saada epänormaaleja tuottoja.

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1 Introduction

In the past several decades, dividends have played an important role in a corporate world. Researchers have tried to investigate the motivation of the firms to pay dividends and investors for receiving them given that dividends are most often more heavily taxed than capital gains (Hasan 2022). In perfect capital markets dividend policy should not have any effect on firm's value assuming that when new information arises in markets it should be reflected without any delay in stock prices (Fama 1970). Empirical evidence has showed that dividends have significant signaling power on market. However, from the theoretical point of view it is still unclear whether the stock prices should change in the same direction as the announced dividend changes. If shareholders preferred capital gains to dividend payouts, higher dividends would lead stock prices to fall since the demand for equity will decrease. Alternatively, it is argued that shareholders revise their expectations if they believe that prices do not correspond their beliefs at the time of the announcement. Thus, the stock price reaction to dividend change announcements reflects the average change in shareholders' beliefs caused by asymmetric information between shareholders and the firm. (Gurgul, Mestel & Schleicher 2003).

In corporate finance, dividend policy has been an unexplained phenomenon for several decades (Chen, Liu & Huang 2009). The dividend payout is argued to be a function of factors including free cash flows, stability of earnings, growth rate, profitability of the firm and the governing structure of the firm (Brunzell, Liljeblom, Löflund & Vaihekoski 2014). The main reason for managers to pay dividend is to signal to the market an important information about firm's current and future financial performance, i.e., sending signals about the firm's future earnings (Dasilas, Ginoglou & Lyroudi 2008). Previous research has argued that one of the most important reasons behind dividend distribution is based on imperfections in markets due to information asymmetries (Dasilas & Leventis 2011). It is argued that dividend paying firms should encounter less information asymmetries compared to non-dividend paying firms since dividend paying firms narrows the information gap between the managers and investors (Li & Zhao 2008). Therefore, dividend change announcements provide valuable information to the market reflecting the managers' expectations of current and future cash flows (Dasilas & Leventis 2011). The theory argues that dividend increases have a positive

effect on stock prices and opposite holds for dividend decreases, signalling that an increasing dividend signals to market a strong future financial performance of the firm and decreasing dividend signalling the opposite (Dasilas et al. 2008; Hasan 2022). A positive correlation between stock prices and announced dividend changes is also supported by behavioural finance models. These models consider also behavioural and socioeconomic effects on shareholder and managerial activities. (Gurgul et al. 2003)

According to Miller & Modigliani (1961) a change in a dividend rate is most often followed by a change in the stock price, but this can only be seen under uncertainty. Dasilas & Leventis (2011) analyse the stock market reaction on dividend announcements in Greece market during 2000−2004. They argue that dividend announcements seem to have significant effect on stock prices and find support for dividend signalling hypothesis. Their results suggest that stock prices tend to react positively on dividend increase announcements and negatively on dividend decrease announcements. They also suggest that trading volume moves to the same direction as the dividend changes. (Dasilas & Leventis 2011) Hasan (2022) reports similar findings in UK stock market. He finds evidence to support the dividend signalling hypothesis since stock market seems to react positively on dividend increase announcements and negatively on the dividend decrease announcements. Hasan (2022) also suggests that investors require higher returns to hold the stocks during dividend announcement as a compensation for the increased risk per unit of time in that period.

Chen et al. (2009) examines the dividend announcement effect in Chinese stock market. One of their interesting findings is that the stock market seems to react positively both on the dividend increase announcements and the dividend decrease announcements which does not fully support the dividend signalling hypothesis. They also suggest that dividend yield has the highest explanatory power for explaining the abnormal share price behaviour around the dividend change announcements. Similar findings are reported also by Dasilas & Leventis (2011). Christie (1994) shows evidence that risk-adjusted excess returns and the magnitude of dividend reductions' relation is more complex and show critical evidence against the dividend signalling effect and agency cost theory. Similar findings are also reported by Downes and Heinekel (1982).

Despite the increasing research it is still argued that the dividend policy is one of the most important unsolved problems in corporate finance (Al-Najjar & Kilincarslan 2019; Bhattacharyya 2007). Previous research has showed evidence that the dividend policy has a

significant effect on the firm value, but the results have not been fully consistent with one another (Hasan 2022). Overall, current, and previous research has mainly focused on US and other large capital markets where firms are well committed to pay dividends as a quarterly basis. Relatively limited evidence exists in Nordic capital markets giving an important weight to research the topic more and with more recent data. Most of the Nordic listed firms pay their dividends annually which might imply that Nordic firms do not have as much focus on dividends. Although previous research has argued that Nordic firms are committed to pay dividends and comparable high (Liljeblom, Mollah & Rotter 2015). Previous research has also argued that dividends play more important role in common law countries compared to Scandinavian civil law countries (Eije & Megginson 2008; Ferris, Jayaraman & Sabherwal 2009) but the results have not been consistent with each other (Liljeblom et al. 2015). According to Eije & Megginson (2008) common law countries' shareholders can affect more heavily on dividend policy and force managers to pay out free cash flows due to different legal systems and investor protection whereas in civil law countries shareholders can do this less easily due to lower investor protection. In this study the aim is to fill research gaps in Nordic region. According to the knowledge of the author this is the first study to combine the stock price reactions and trading volume changes on different dividend change announcements in Nordic region.

1.1 Dividend policy

One of the most common ways of distributing earnings to shareholders is through dividends. Firms announce dividends and pay them on a per-share basis. There are five types of dividends which the most common one is cash dividend where a distribution of the firm's current earnings is shared to shareholders in cash. The other four types of dividends are stock dividend, property dividend, scrip dividend and liquidating dividend. In this thesis the focus is on cash dividends and the following example is based on this. If a firm decides to pay out 5 billion EUR in dividends, and currently it has 1 billion outstanding shares, it may pay an annual dividend of 5 EUR per share. Some firms also pay dividend quarterly, in this case 1.25 EUR, or even monthly, in this case 0.42 EUR. Dividend policy varies between firms and countries, but most commonly dividends are paid on a quarterly or annually. According to theory, dividends should reflect the firm's financial state and decrease the uncertainty and increase the legitimacy of decision-making in the firm. (Linden, Lehner, Losbichler &

Martikainen 2021) Theory also suggest that firms can build a good reputation among shareholders by paying dividend and sharing part of the earnings with them (Liljeblom et al. 2015).

There are several ways how to form dividend policy. The main determinant of the current dividend is current earnings while deviations from the target represent the signaling component. Another potential dividend policy target is dividend per share which is only weakly related to the performance of the firm's historical current earnings. Theory suggest that dividends may also be linked to other measures such as the stock price. It is argued that the signalling effect of dividends occurs in contrast to an established dividend policy. On the contrary, a highly controlled dividend policy reduces the signalling effect. For example, if the firm has a specific dividend payout ratio and it follows it strictly, there are no information value for the dividend in contrast what is already known through the disclosure of current earnings. (Liljeblom et al. 2015)

1.1.1 The partial adjustment model

It is argued that managers set cash dividends in accordance with earnings and lagged dividends. Thus, they make partial adjustments to a target payout ratio to smooth streams of dividend payments rather than reflecting the changes in earnings immediately. (Al-Najjar & Kilincarslan 2019) Lintner (1956) argues that managers increase dividends only when they believe that earnings can maintain higher dividends permanently. In addition, they are also unwilling to decrease the dividends, unless there are not adverse circumstances. Lintner (1956) suggests that firms have target dividend levels which are determined based on the earnings and target payout ratios in that year. The target dividend payment can be expressed as follows:

$$D_{i,t} = r_i E_{i,t} \quad (1)$$

Where $D_{i,t}$ is the target dividend payment for firm *i* at time *t* and r_i is the target payout ratio for firm *i*. In formula 1, $E_{i,t}$ is the net earnings for firm *i* at time *t*. Lintner (1956) argues that the actual difference from year *t-1* dividend payment to year *t* dividend payment can be formed as follows:

$$D_{i,t} = \alpha_i + \beta_i E_{i,t} + \beta_2 D_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Where α and β are the model parameters representing the constant term and the intercept term respectively, $E_{i,t}$ is the net earnings for firm i at time t and $D_{i,t-1}$ represents the dividend payment of previous year *t-1* for firm *i*. In formula 2, ε represents the error term. According to Lintner (1956) the constant term α, in formula 2, should be positive implying the reluctance of the management to decrease dividends. The model is widely accepted for understanding the behaviour of the firm's dividend over time (Al-Najjar & Kilincarslan 2019).

Figure 1 shows the timeline of dividend. Declaration date is the date when a firm announces its dividend. This is most often the date when the firm's board of directors announces the dividend including a statement of the next dividend payment date, the expected dividend size, and the ex-dividend date. The declaration date is followed by an ex-dividend date which is the first date when the stock trades without the dividend payment part. Theory suggests that the price drop on the ex-dividend date should be equal to a dividend amount (Legenzova, Jurakovaite & Galinskaite 2017). However, considering the tax effect this might differ due to different dividend tax policies of the countries (Mori 2010). Record date is a date when investor must be an official owner of a stock to receive the dividend. This date is usually following two days after the ex-dividend date. The record date is followed by the payment date when the dividend is actually paid to investors. In this study the focus is on the declaration day, i.e., dividend announcement day. The declaration date is an important date for investors providing a valuable information whether the investors are entitled to receive a dividend or not. In addition, the information of the dividend size and change is informed providing a beneficial information about the future prospects of the firm.

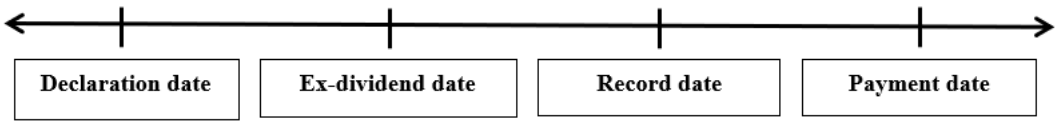

Figure 1 Dividend timeline

The most statements on dividends announced by the firm's board of directors also include announcements for other significant news of the firm, which the most important one is

information about the earnings. In assessing the information content of dividend announcements, it is impossible to exactly isolate the effect of the dividend information on stock prices from the effect of earnings announcements. However, previous research has argued that the market puts more importance on dividends than on earnings. (Gurgul et al. 2003) As mentioned previously, dividends are paid from the firm's earnings and earnings are the profits of the firm's performance. The theory argues that the agency costs imply the shareholder preference for dividends over the profit, and the likelihood of the firms with a notable dividend payment to improve their firm value by decreasing the available funds amount to managers (La Porta, Lopez-De-Silanes, Shleifer & Vishny 2000).

1.1.2 Dividends in Nordic markets

According to Brunzell et al. (2014) capital structure of the firm plays an important role in Nordic dividend policy. Nordic firms are generally conservative with debt and aim to keep a margin for safety, implying that the dividend growth has less importance in decision making. Historically Sweden has the most focus on dividend growth of the Nordic countries, aiming to pay out higher dividend than previous year. (Brunzell et al. 2014) When it comes to dividend frequency, most of the Nordic dividend-paying firms pay dividend annually which differs from the policy in US. However, recently some of the larger firms such as Kesko and Nokia have started to pay dividend semi-annually or even quarterly.

Shareholders have right to attend to general meetings of the firm and vote for the proposed corporate actions depending on their voting rights of the shares. By this means shareholders can participate on the proposed shared dividend decisions. (Kinkki 2008) In Finland, the distribution of dividend is regulated in Finnish Limited Liability Companies Act (624/2006) in chapter 13 of the law. The distribution and the dividend amount are determined in general meeting of the firm and is based on the latest financial statement. Firms can pay dividend either in cash or in natura which most often means dividend payment as a stock dividend. (Finnish Tax Administration 2022) Similarly, in Denmark, the Danish Limited Liability Companies Act regulates the dividend distribution and in Sweden the Swedish Limited Liability Companies Act (2005:551). According to the law the dividend distribution and shared amount per dividend is decided in general meeting of the firm which is consistent with the regulation in Finland. Principally the amount of the dividend may not exceed the

limit set by the firm's board of directors. (Danish Business Authority 2021; Finnish Tax Administration 2022; Sveriges Riksdag 2023) Overall, the regulations of dividend distribution are similar in Nordic region, but the tax treatment differs between countries which provides an interesting view to this research.

Table 1 shows the dividend and capital gain tax rates for individual investors in Nordic region. In this thesis, the sample consist only of publicly listed firms. Thus we ignore the taxation for dividends and capital gains received from private equity firms. The dividend tax rates for individual investors are progressive for investors in Finland and Denmark, unlike in Sweden, where dividend income is taxed at the same rate regardless of the income amount. (Danish Tax Administration 2023; Deloitte 2022; Finnish Tax Administration 2022) In Denmark, dividend income up to 58 900 DKK (Danish Krone) is taxed at 27 % rate whereas exceeding part of income is taxed at 42 % rate (Danish Tax Administration 2023). In Finland, certain part of the dividend income is tax-exempt for investors which differs from the tax regulations in Denmark and Sweden. Tax-free part of the dividend income for Finnish investors is 15 %. The rest of the income, 85 %, is taxable at progressive rate. The income up to 30 000 EUR is taxed at 30 % rate and the exceeding part is taxed at 34 % rate respectively. (Finnish Tax Administration 2022) Taxation in Sweden differs from the taxation in Denmark and Finland, as the progressive tax rate is not imposed to Swedish dividend income. In Sweden the dividend income is taxed at 30 % flat rate. (Deloitte 2022)

Table 1 Tax rates for dividends and capital gains for individual investor

	DIVIDENDS	CAPITAL GAINS
DENMARK	Dividend income under 58 900 DKK taxed at 27 % tax rate. Exceeding part of the income taxed at 42 % tax rate.	Capital income under 58 900 DKK taxed at 27 % tax rate. Exceeding part of the income taxed at 42 % tax rate.
FINLAND	Tax-free part 15%, and 85 % of the income is taxable. Taxable part of the income (85 %) is taxed similarly as capital income.	Income to 30 000€ taxed at 30 % rate and exceeding part at 34 % tax rate
SWEDEN	Taxed at 30 % tax rate.	Taxed at 30 % tax rate.

One of the interesting aspects behind dividends is the taxation between dividends and capital gains. As discussed previously, investors must also pay tax on capital gains when they sell their shares. According to clientele effect hypothesis market should see the dividend as a positive signal in countries where dividends have lower tax rate compared to capital gains. In addition, if the tax rates are equal for dividends and capital gains, investor should be indifferent between the incomes earned. (Mori 2010) However, unlike in dividends investors can choose when to realize capital gains and losses (Dahlqvist et al. 2014). The tax rates on capital gains for individual investors can also been seen on table 1. In Denmark capital income is taxed similarly as dividend income, i.e., income up to 58 900 DKK is taxed at 27 % rate and exceeding part of the income is taxed at 42 % rate (Danish Tax Administration 2023). In Finland the capital income up to 30 000 EUR is taxed at 30 % rate and the exceeding part of the income is taxed at 34 % rate. Thus, the taxation of capital income follows the same approach as for dividends, except there are not tax-exempt part for capital gains. (Finnish Tax Administration 2023) In Sweden the capital income is taxed similarly as the dividend income, at 30 % flat rate (Deloitte 2022).

Dividends are taxed differently for individuals and corporations. In Finland public corporations do not pay tax on dividends. Instead, the policy is formed that tax is paid only based on the earnings of the firm and dividends are not taxed separately. In Finland the earnings are taxed at 20 % rate. (Finnish Tax Administration 2022) Similar approach is also used in Sweden where corporations do not pay separate tax on dividends. Their earnings are taxed at 20.6 % rate. (PwC 2023b) In Denmark, the earnings are subjected to a taxation at 22 % rate (PwC 2023a).

1.2 Objectives of the research

The objective is to study stock market reaction on dividend announcements and how market reacts on different types of dividend announcements, i.e., dividend increase, dividend decrease and constant dividend announcements. The aim is to research the stock price reaction to the dividend announcements on the event day itself and around it. The announcement (event) day is defined as a day when the board for very first time announce the official statement of upcoming dividend. In addition, the aim in this thesis is to research how trading volume changes around dividend announcements providing an important

information about the stock's liquidity and whether the new information in market released by dividend announcements causes any selling or buying pressure on traded stocks. According to Gurgul et al. (2003) the empirical analysis of trading volume changes is even more important than stock price reactions since changes in stock prices examine the average reaction on events, whereas trading volume reflects the sum of differences in reactions of traders. Trading volume may rise even though stock prices do not react on the event. Unchanged stock prices reflect that investors differ between interpretations of the announced news that are averaged out in returns data. (Gurgul et al. 2003) This thesis also examines whether there are any differences in stock price reactions based on the market capitalization of the firms. According to dividend signalling hypothesis smaller firms should have more pronounced reactions on dividend announcements due to lower transparency and higher expectations of the future financial performance of the firm (Günther 2017).

The stock market reaction on the dividend announcements is approached via five different research questions. First two of them focus on to research how stock prices react on dividend announcements and whether there are any differences between different dividend announcements. The first two research questions are defined as follows:

1. *Do dividend announcements have an abnormal effect on stock returns?*
2. *Are there any differences in abnormal stock returns between different dividend announcements? Are there any differences between exchanges?*

The third and fourth research questions focus on the trading volume responses on dividend change announcements around the dividend announcement day. The research questions are defined as follows:

3. *Does trading volume change around the dividend announcement?*
4. *Are there any differences in abnormal trading volumes between different dividend announcements? Are there any differences between exchanges?*

The last research question focuses on whether the abnormal returns or abnormal trading volumes on the dividend announcement day are driven by the market equity of a firm. The aim is to find out whether there are any differences on the stock market reactions between the mid-cap firms and large-cap firms. The last research question is defined as follows:

5. *Do the stock market reactions on the dividend announcements differ between firms based on their market values? Are there any differences between mid-cap firms and large-cap firms?*

The thesis relies on the event study methodology which is used to investigate the stock price and trading volume reactions on the dividend announcements. The 11−day event window includes the stock market reaction on the event day itself and on both pre-event and post-event periods. Data is collected from Refinitiv from January 2018 to December 2022 covering 5−year period. The research period covers the uncertain COVID-19 crisis period therefore providing a valuable information for shareholders about the recent crisis periods effects on firm's dividend policy.

1.3 Limitations

This paper focuses on listed companies in OMX Copenhagen, OMX Helsinki and OMX Stockholm included in OMX Nordic Large Cap Index and OMX Nordic Mid Cap Index. We only investigate the regular final cash dividend announcements, excluding all the other dividend announcements. This thesis examines the stock market reactions only in short-term using a 11-day event window. Consequently, the long-term market reactions are omitted.

The overall structure of the thesis is as follows: In the second chapter previous research in this research field is introduced, including international evidence and specific research in Nordic markets. Chapter three begins by laying out the theoretical dimensions of the research, which enables to understand the market behaviour and expectations on dividend announcements. The third chapter ends by forming the research hypotheses of this study. The fourth chapter is concerned with the methodology used for this study. The data used for this study is also introduced with descriptive statistics. The fifth chapter presents the findings of the research. In the last chapter the results of this study are summarized, and some future research ideas are proposed.

2 Previous research

The majority of the previous studies have set their focus on to understand the relation between dividend policy and the value of a firm (Chen et al. 2009). Dasilas & Leventis (2011) research the stock price and trading volume responses on dividend announcements during 2000−2004 in the Athens Stock Exchange. According to their results a positive and statistically significant stock price reaction on dividend increase announcements exists, while the Greece stock market seems to react negatively on dividend decrease announcements. The results show that constant dividend announcements do not have a significant effect on stock prices implying that the market incorporates the dividend news in an efficient manner. Overall, the results show that the daily abnormal return on the dividend announcement day is 0.374 % and exceeds 0.5 % level in case of dividend increases. The trading volume of the stocks moves to same direction as stock prices. In case of dividend increases the authors report increase in trading volume whereas in case of dividend decrease announcements they report decrease in trading volume. According to the results, the abnormal trading volume is 19.02 % for dividend increases and -35.58 % for dividend decreases on the dividend announcement day. Dasilas & Leventis (2011) also conclude that dividend yield has the highest explanatory power on abnormal returns on the dividend announcement day. Similar results from UK stock market are also reported by Hasan (2022) who reported that a dividend increase announcement is estimated to increase the stock return 6 basis points on average.

Chen et al. (2009) research cash dividend changes in the Shanghai Stock Exchange and the Shenzhen Stock Exchange during 2000−2004. The sample consists of 460 dividend increase announcements and 422 dividend decrease announcements while excluding the constant dividend announcements from the study. The results of the study show that dividend change announcement has effect on stock prices, but this effect can be only partially explained with the dividend signalling effect since the stock market reacts positively both dividends increase and decrease announcements. Thus, this is not fully consistent with the results by Dasilas & Leventis (2011) and Hasan (2022). They argue in the paper that the results may differ from previous studies also due to different regulations and policy in China. In the paper they also argue that dividend yield has the highest explanatory power on abnormal returns on the

dividend announcement day which is in contrast consistent with the findings by Dasilas & Leventis (2011). (Chen et al. 2009) Legenzova et al. (2017) research the dividend announcement effects on stock prices of listed firms in NASDAQ OMX Baltic during 2010−2015. According to their findings positive AARs are found but they are statistically insignificant. In the paper they argue that results indicate weak market efficiency in NASDAQ OMX Baltic since the AARs are positive during the post-event window which do not support the price drop shortly after the dividend announcement. However, in yearly analysis they found positive and statistically significant AARs in 2011 and 2015 analyses. The results of their study differ substantially from the results of Dasilas & Leventis (2011) and Hasan et al. (2022).

Gurgul et al. (2003) research the stock market reaction on dividend announcements in the Austrian Stock Exchange during 1992−2002. The results of the study show that Austrian stock market reacts on dividend increase announcements positively and on dividend decrease announcements negatively. According to the findings of the study, abnormal return for dividend increases is 0.72 % on the dividend announcement day and -1.26 % for dividend decreases, implying that market reacts more significantly on dividend reductions. Constant dividend announcements do not have a significant effect on stock prices on the announcement day. In addition, according to the results the stock market incorporates the news quickly and an efficient manner which is consistent with the findings of Dasilas & Leventis (2011). Gurgul et al. (2003) argue also that dividend announcements have a statistically significant effect on trading volume around the dividend announcement day. This is also consistent with the findings by Dasilas & Leventis (2011) in the Athens stock market. However, unlike Dasilas & Leventis (2011) Gurgul et al. (2003) find positive trading volume change for all dividends change announcements. They argue in the paper that investors differ in the precision of their private prior information and are diversly informed, thus they respond to new information differently which leads to an increase in trading volume for all dividends change announcements. In addition, the abnormal trading volume may also be result of portfolio revisions by noise-traders based on the price changes rather than new information. Similar results are also reported by Karpoff (1986) and Kim & Verrecchia (1991). Gurgul et al. (2003) analyses also whether stock return volatility is affected by news in dividends. According to the results the variance of abnormal returns increases sharply during the dividend decrease announcements implying that bad news has stronger impact on financial markets than good news. (Gurgul et al. 2003)

Al-Shattarat, Atmeh & Al-Shattarat (2013) report evidence from emerging markets. They study the stock market reaction on dividend announcements and how trading volume changes around the announcement day. Their study consists of firms listed in Amman Stock Exchange in Jordan during 2005−2010, including 183 observations for dividend releases and 132 for no-dividend releases. They argue in the paper that stock market reacts positively on dividend announcements, also showing some overreaction straight after the announcement day. According to the results there are not significant abnormal returns for no-dividend release sample which is consistent with the theory. In the paper they argue also that there is a value relevance for dividends rather than dividend's change. (Al-Shattarat et al. 2013) Christie (1994) research the relation between dividends and share prices in New York Stock Exchange (NYSE) and American Stock Exchange (AMEX) during 1962−1985. The results of the study show evidence that the empirical relation between risk-adjusted excess returns and the magnitude of dividend reductions is complex and do not support the dividend signalling or agency cost theory. Similar findings are also reported by Downes & Heinekel (1982).

Günther (2017) research historical capital market effects around dividend announcements in Berlin stock exchange in 1895. Based on his findings Berlin stock market reacts positively and significantly on dividend increase announcements, and negatively on dividend decrease announcements. According to the findings, stock market seems to react in advance for dividend increase announcement since the positive stock price reaction is noticed prior the event day. The negative stock price reaction for dividend decreases is seen on the announcement day. Interesting finding of the study is that the effects are more significant for smaller firms that have lower transparency in financial reporting. The results also indicate that the trading volume changes are negatively associated with the market value of the firm implying that the firm's market value has some explanatory power on the abnormal returns. Günther (2017) argues that event-induced trading follows the differential beliefs revisions suggesting that the smaller firms experience higher increase in trading. (Günther 2017) Similar results are also suggested by Ziebart (1990) who examines the event-induced trading between the different size of firms. Chen, Lin & Ma (2019) investigate whether individual investor's buying differs from individual investor's selling in the sense of demanding or providing liquidity around the dividend announcement of the firm. Data of the study consists of the firms listed in Taiwan stock exchange during 2005−2011. They argue in the paper that

individual buyers demand liquidity while individual sellers provide liquidity around the dividend announcements. According to the findings the buying volume of individual investors around the dividend announcements negatively predicts the future earnings of the firm and is positively related with the past and contemporaneous returns. The findings of the paper show similar results for the selling volume of individual investors. (Chen et al. 2019) Fuller (2003) show evidence that the returns on the announcement day for dividend increases are inversely related to measures of informed trading. In addition, the returns are decreasing in the level of buy demand relative to sell demand. They argue in the paper that interaction within the market participants explains why all dividend increases are not seen as good news by market thus showing that informed trading results in larger dividend increases. (Fuller 2003)

Li & Zhao (2008) examine how informational asymmetries affect the dividend policy of the firm investigating the relation between the dividend policy of the firm and the quality of its information environment. The results of their study indicate that firms that are more subject to information asymmetry are less likely to pay dividends, increase the paid dividend or initiate dividend. These firms are also more likely to distribute smaller dividend. Overall, the results show that there is a negative relation between dividend policy and information asymmetry implying that dividends do not have any signalling effect on market. (Li &Zhao 2008) The results are partially consistent with the results by Chen et al. (2009) who report positive stock price reaction on both dividend increases, and dividend decreases. Miller & Rock (1985) instead argue that there is a signalling equilibrium that is informationally consistent under asymmetric information and the trading of stocks restoring the time consistency of investment policy. However, this leads to lower investment levels than achieved optimum under perfect information. (Miller & Rock 1985)

2.1 Previous research in Nordic markets

Liljeblom et al. (2015) research whether dividends signal future earnings in the Nordic stock market. They use data from three different Nordic countries, Sweden, Denmark, and Norway, investigating the signalling effect during 1969−2010 with a monthly data. The findings of the study show that there are significant differences between these three previously mentioned countries. The results strongly support the signalling effect of the

dividends in Sweden, but opposite support is found in Norway. According to the findings of the paper even a small variation in corporate governance, legal regimes, macroeconomic environments, or ownership structures influences the results, thus playing an important role in dividend policy. (Liljeblom et al. 2015) Brunzell et al. (2014) argue that Nordic firms are more likely to use dividends for agency or monitoring reasons rather than signaling reasons. Their data consist of Nordic countries, i.e., Denmark, Finland, Iceland, Norway, and Sweden. The study is conducted with a questionnaire directed to all chairpersons of the board of firms in Nasdaq Nordic and Oslo exchange. The findings of the study show that 72 % of the Nordic firms have a specified dividend policy that are mostly affected by the firm's capital structure and future earnings. Overall, Brunzell et al. (2014) argue that Nordic firms have relatively concentrated ownership structures that play an important role in firm's dividend policy over traditional tax or signalling based rationalities. (Brunzell et al. 2014)

Linden et al. (2021) research the signalling effect of dividends by examining how actual or expected change in profitability under crisis period is reflected by owners and is directed to dividend payout decisions under uncertainty. In the study they use recent data from 2019 to 2020 concentrating on COVID-19 crisis and the dividend performance for Finnish firms during that time. Findings of their study shows that when firms are dominantly owned by individual investors there are significant effect on dividend policy. In the paper they argue that ownership structure of the firm plays an important role on firm's dividend policy which is consistent with the findings by Brunzell et al. (2014). Linden et al. (2021) present also results of lower dividend during the crisis. They argue that lower dividend is a consequence of the firm's aim to keep larger cash reserves during the crisis and not due to firm's lower profitability. (Linden et al. 2021) Bechmann & Raaballe (2007) research the differences between stock splits and dividends in Copenhagen stock exchange during 1995−2002. Their findings indicate that the announcement effect is closely related to changes in payout policy of the firm. However, they find differences in relationship between the two different event types. They argue in the paper that firms that announce the stock dividend with a split factor of less than two can afford to increase total cash dividends leading to a significant announcement effect, 4.23 %. In addition, announcing the stock dividend with the split factor of two or more increases the total cash dividends and leads to a significant announcement effect but comparable less, 0.08 %. Interesting finding is that the results of the study show that only if the shareholders can be expected to enjoy a substantially high increase in the

cash dividends there are significantly positive announcement effect in stock prices. (Bechmann & Raaballe 2007)

Dahlqvist et al. (2014) research the dividend tax effect using a data set of all domestic stock portfolios in the Swedish market during 2001−2005. The findings of their study show that investment funds that have higher tax rate on dividend income compared to capital gains prefer non-dividend-paying stocks. The results show that in Sweden tax neutral investors, i.e., investment funds and partnerships, behave according to the dividend tax clientele hypothesis. However, the results for businesses and individuals are not consistent and depend on the sample and empirical specifications. Dahlqvist et al. (2014) argue in the paper that foundations prefer dividend-paying stocks, but it is unclear whether the dividend preferences are related to favourable income taxation or charter provisions which require foundations to do distributions from income and not from the principal. (Dahlqvist et al. 2014)

3 Theoretical background and hypotheses development

In this chapter the main hypotheses trying to explain the stock market reaction on dividend announcements are explained. These hypotheses are efficient market hypothesis, dividend irrelevance hypothesis, dividend signalling hypothesis, agency cost theory and clientele effect hypothesis. The chapter ends by introducing the research hypotheses of this study based on the theory. According to efficient market hypothesis new information in the market should reflect in stock prices without any delay (Fama 1970). Dividend irrelevance theory states that dividends do not have any effect on the value of the firm (Miller & Modigliani 1961). However, several hypotheses including dividend signalling hypothesis, agency cost theory and clientele effect, show that dividends do influence share prices. According to dividend signalling hypothesis it is expected that stock market reacts positively on dividend increase announcements and negatively on dividend decrease announcements implying that dividend announcements have a signalling effect on the market (Dasilas & Leventis 2011). The agency cost theory states that shareholders prefer dividends over the profit since the firms with a notable dividend payment improve their value by decreasing the amount of funds available to managers (La Porta et al. 2000). Clientele effect hypothesis suggests positive stock price reaction on the dividend increase announcement day due to its tax option impact (Lamoureux & Poon 1987).

3.1 Efficient capital market

According to efficient market hypothesis stock prices reflect fully all the available information at any time (Fama 1970). When new information arises in market the news spread quickly and reflect on stock prices without delay. The notion behind the efficient market hypothesis is the idea of random walk which describes the price series where all the subsequent changes in prices present random departures from previous prices. The idea of the random walk is that if the information flow is accessible and reflects without any delay in stock prices, the price change of tomorrow will reflect only news of tomorrow and will be independent of the changes in prices today. The resulting price changes must be unpredictable and random since the news are unpredictable. (Malkiel 2003)

Although the efficient market hypothesis is widely accepted, recently previous research has argued that stock prices are at some level predictable and have found evidence against the efficient market hypothesis. Malkiel (2003) argues that the stock market is not always perfect, and the stock prices are partially predictable. Economists have provided evidence about the psychological and behavioural determinants that have effect on stock price determination. They have argued that predictable patterns in stock prices enables investors to enjoy excess risk adjusted rates of return. (Malkiel 2003)

3.1.1 Three forms of market efficiency

Fama (1970) introduces the three forms of market efficiency, weak form, semi-strong form, and strong form. In the weak form of market efficiency stock prices reflect only historical prices. The notion of random walk is closely present in this form of market efficiency. The semi-strong form of market efficiency is the form where stock prices adjust efficiently also to other available information that is publicly available, i.e., dividend announcements, earnings announcements, stock splits etc. In the strong form of market efficiency, the given investors or certain groups have monopolistic access to any relevant price information. (Fama 1970)

Kumar, Soni, Hawaldar, Vyas & Yadav (2020) research the three forms of market efficiency in Indian stock market finding partial evidence of market efficiency. The findings of their study show that Indian stock market is efficient in the weak form of an efficient market hypothesis. In the contrary, they argue in the paper that the responses to the event announcements are not complete on the event day and conclude that the stock market is not efficient in the semi-strong form of market efficiency. Similarly, they found evidence against the strong form of market efficiency in Indian stock market either. (Kumar et al. 2020) Rahman, Naser, Islam & Hossain (2021) show evidence that do not support the random walk model or weak form of market efficiency. In the paper they study the market efficiency of the Dhaka Stock Exchange (DSE) during 1993−2015. In the paper they argue that the stock market seems to react to new information substantially slowly. Similar findings are also reported by Dsouza & Mallikarjunappa (2015) who show international evidence that the stock market does not follow the random walk model.

3.2 Dividend irrelevance theory

Miller & Modigliani (1961) state that in rational and perfect economic environment dividends are irrelevant. In the paper they argue that an increase in dividends, given the investment policy of the firm, reduces the terminal value of the existing shares since part of the future dividend must be diverted to attract the outside capital. Consequently, the dividend market value for the outsiders must be always the same as the increase in the current dividend. (Miller & Modigliani 1961) Dividend irrelevance theory assumes that in the perfect capital markets there is no conflict of interest between shareholders and managers of the firm. The theory assumes that the information is free, and all investors can access to this information. Under these circumstances there are not any transaction costs when buying or selling the stocks, or any tax differences between dividends and capital gains do not exist. (Budagaga 2017) According to irrelevance theory dividends do not have any effect on the value of the firm (Miller & Modigliani 1961).

Brennan (1971) supports the existence of the dividend irrelevance theory and states that dividends in fact do not have any effect on the value of the firm. He argues in the paper that to reject the irrelevance theory investors in the market must be irrational and share prices rely on the past events and the expected future prospects in the market. Similar findings are suggested also by Araujo et al. (2011) who present evidence that the dividend policy should be considered irrelevant since dividends do not signal any information to market, except fairly poor. Chen et al. (2002) also found evidence to support the irrelevance theory. They argue in the paper that cash dividends do not have a significant effect on the stock prices which supports the dividend irrelevance theory (Chen et al. 2002)

Despite the support of the dividend irrelevance theory, the irrelevance theory has also encountered some criticism. Increasing amount of research has found support that the dividends have some explanatory power on the firm value. Dasilas et al. (2008) find evidence that increase in the dividend effects on the stock price positively thus signalling to the market a strong financial performance of the firm. Similar findings are also reported by Hasan (2022) in the UK stock market. Dasilas & Leventis (2011) show also evidence that stock market seems to react significantly on dividend announcements implying that dividends provide new valuable information to the market. Similar findings are also reported by

Günther (2017) in Berlin stock exchange and Gurgul et al. (2003) in the Athens's stock exchange.

3.3 Dividend signalling hypothesis

Miller & Modigliani (1961) argue that under uncertainty in imperfect markets dividends tend to have some explanatory power in stock market. They argue in the paper that a change in a dividend rate is most often followed by a change in the stock price, but this can only be seen under uncertainty. (Miller & Modigliani 1961) Dasilas & Leventis (2011) show evidence that dividend announcements seem to have significant effect on stock prices and finds support for dividend signalling hypothesis. Their results suggest that stock prices tend to react positively on dividend increase announcements and negatively on dividend decrease announcements. (Dasilas & Leventis 2011) Hasan (2022) reports similar findings in UK stock market. He finds evidence to support the dividend signalling hypothesis since stock market seems to react positively on dividend increase announcements and negatively on the dividend decrease announcements. (Hasan 2022)

Stock market reaction on dividend announcement can be explained with the fact that a change in a dividend rate is seen as a change in the management's expectations of future prospects of the firm (Miller & Modigliani 1961). The theory argues that dividend increases have a positive effect on stock prices and opposite holds for dividend decreases, signalling that an increasing dividend signals to market a strong future financial performance of the firm and decreasing dividend signalling the opposite (Dasilas et al. 2008; Hasan 2022). One important aspect to be considered is that investors might well be mistaken in giving explanatory power to dividend change announcements and manager's view of prospects of firm's earnings. The management might only change the dividend rate to manipulate stock price. (Miller & Modigliani 1961) Al-Shattarat et al. (2013) examine the dividend signalling in emerging markets. The sample consist of listed firms in the Amman Stock Exchange during 2005−2010. According to their results there are significant and positive abnormal returns on the dividend announcement day for firms announcing the dividends, supporting the dividend signalling hypothesis. Consistent with the findings, Gurgul et al. (2003) show evidence that the dividend announcement effect in Austrian Stock Exchange strongly

support the hypothesis that announcements of the upcoming dividends do have impact on the share prices.

Despite the increasing support of dividend signalling hypothesis, the dividend signalling hypothesis has also encountered some criticism. It has been argued that the statistical evidence of positive relation between dividends and stock prices is weak (Araujo et al. 2011). Benartzi, Michaely & Thaler (1997) argue that the dividend rate does not have significant impact on the stock price, implying that the dividend announcements do not predict the future prospects of the firm. They argue in the paper that dividends provide some information to market but that is something what has already happened, not what will be coming. Thus, they cannot find fully support for dividend signalling hypothesis. (Benartzi et al. 1997) Similar results are reported also by Watts (1973) in US stock market. His results suggest that the information content of dividends is rather trivial than significant. (Watts 1973) Chen et al. (2009) report also only partial evidence for dividend signalling hypothesis. The findings of their study imply that the stock market seems to react positively both on the dividend increase announcements and the dividend decrease announcements which does not fully support the dividend signalling hypothesis. (Chen et al. 2009)

3.4 Agency cost theory

According to agency cost theory the earnings of the firm might be directed to managers' personal utility or committed to unprofitable ventures providing private benefit for managers unless they are not distributed to the outside shareholders (Budagaga 2017). It is argued that the payouts to the shareholders reduce the power of the firm's management and the resources under the managers' control (Jensen 1986). The theory argues that the agency cost implies the shareholder preference for dividends over the profit, and the likelihood of the firms with a notable dividend payment to improve their value by decreasing the amount of funds available to managers. La Porta et al. (2000) argues that one of the solutions to agency problems is the law. Corporate law and other laws enable investors to benefit of certain power for protecting their investments against expropriation by insiders. These so-called powers include the right to receive the same per share dividends as the insiders, the right to sue the firm for damages and the right to vote on important corporate matters, including the

election of firm's directors etc. Thus, one of the proxies for lower agency costs is investor protection. (La Porta et al. 2000).

La Porta et al. (2000) research the agency cost theory using cross-sectional variation using data of 4000 firms from 33 different countries. In the paper they discuss about the agency costs in dividends using two different models which first they refer dividend outcome model where dividends are an outcome of effective legal protection of the shareholders. The second model they refer to a dividend substitute model where dividends are a substitute for effective legal protection. Their study shows that agency approach in dividends is very important for understanding dividend policies around the world. The findings of the study imply that firms which operate in countries where the investor protection is better, the dividends are also higher. More specifically, in these countries, fast growing firms pay lower dividends compared to slower growing firms. This is consistent with the idea that investors that are well legally protected are more willing to wait the dividends when investment opportunities are good compared to more poorly legally protected investors. (La Porta et al. 2000) Christie (1994) study the effect of dividend reductions and omissions in New York Stock Exchange (NYSE) and American Stock Exchange (AMEX) during 1962−1985. According to the results of the study, the empirical evidence between risk-adjusted excess returns and the magnitude of dividend reductions is complex and it cannot be concluded that the dividend reductions are straight related to agency costs. (Christie 1994) Similar findings are also reported by Bernheim & Wantz (1995).

3.5 Clientele effect

When firms pay dividends, investors must pay tax on dividends. Investors must also pay tax on capital gains when they sell their shares, but unlike in dividends they can choose when to realize capital gains and losses. (Dahlqvist et al. 2014) This leads to a taxation problem that investors must consider between dividends and capital gains. Marginal tax rate on dividends is most often higher for individual investors than corporate investors. Opposite holds for capital gains since the capital gains are usually more heavily taxed for corporate investors than individual investors. Based on these assumptions individual investors are expected to prefer low-dividend-paying stocks and corporate investors are expected to prefer high-dividend-paying stocks. Corporate investors tend to seek high dividend due to lower tax rate

on dividends compared to capital gains. However, lower tax rate for dividends does not necessarily mean that corporate investors desire higher dividends. It is argued that corporate investors are expected to prefer time-preference-fitted dividends if the tax rate is constant over time. It must be noted that corporate investors must realize capital gains and thus face unfavourable tax treatment if dividend shortfalls exist. This is due to excessive payments due intertemporal double taxation on reinvested dividends. This has resulted to an argument that tax-saving problems should be linked to intertemporal consumption choices. (Mori 2010)

Miller & Modigliani (1961) argue that investors can lower the overall tax by sorting themselves into clienteles where investors paying lower tax on dividends prefer dividends and investors paying higher tax realize capital gains. Overall, the clientele effect theory suggests positive stock price reaction on the dividend increase announcement day due to its tax option impact (Lamoureux & Poon 1987). Miller & Modigliani (1961) also argue that investors are also divided into clienteles based on their age and income preferences. This has also recently found support from behavioural hypotheses (Graham & Kumar 2006). Kawano (2014) researches the clientele effect in the US market during the early 20s dividend tax reduction. She finds evidence to clientele effect and reports that the differential taxation of dividends and capital gains results in investor sorting. She argues in the paper that the effect is both economically and statistically significant which supports that clientele effect in the US market. The results also show that one percentage point decrease in the dividend tax rate compared to capital gains tax rate causes 0.04 percentage point increase in dividend yields. (Kawano 2014)

Miller & Scholes (1982) research whether shareholders with higher dividend yields receive higher risk-adjusted rates of return to compensate the heavier tax rates on dividends compared to longer term capital gains. They argue in the paper that relation between stock price and dividend yield cannot be explained with taxes. (Miller & Scholes 1982) More recent study in Swedish stock market by Dahlqvist et al. (2014) show that the tax-neutral investors. i.e., investment funds and partnerships behave in accordance with the expectations of the dividend clientele hypothesis. However, their results in corporate and individual investors are not consistent with the clientele hypothesis. (Dahlqvist 2014)

3.6 Research hypotheses

There are several theories and hypotheses trying to explain the stock market reaction on dividend announcements. The signalling hypothesis states that dividend increases have a positive effect on stock prices signalling that an increasing dividend signals to market a strong future financial performance of the firm (Dasilas et al. 2008; Hasan 2022). According to efficient market hypothesis stock prices reflect fully all the available information at any time and should be reflected immediately on stock prices (Fama 1970). Clientele effect hypothesis suggests positive stock price reaction on the dividend increase announcement day due to its tax option impact (Lamoureux & Poon 1987). According to agency cost theory shareholders prefer for dividends over the profit of the firm, implying that stock market recognizes the dividends as good news (La Porta et al. 2000). Based on the hypotheses the first research hypothesis of the study is formed as follows:

H1: Dividend increase announcement is followed by a positive stock price reaction

According to efficient market hypothesis stock prices reflect fully all the available information at any time and should be reflected immediately on stock prices. (Fama 1970). According to dividend signalling hypothesis constant dividend announcements do not provide any new or valuable information to market, implying that any significant effect on stock prices should not be noticed (Dasilas et al. 2008). Based on this the second research hypothesis is as follows:

H2: Constant dividend announcement does not have an effect on stock price

According to dividend signalling hypothesis dividend decreases have a negative effect on stock prices, signalling that a market recognizes the decreasing dividend as bad news from the firm (Dasilas et al. 2008; Hasan 2022). Based on the hypothesis the third research hypothesis is formed as follows:

H3: Dividend decrease announcement is followed by a negative stock price reaction

A dividend announcement sets off a chain of events. It is argued that upon the announcement of the dividend, market realises that accompanying the resultant lower price due to price drop on the ex-dividend day will be an expansion in volume. (Lamoureux & Poon 1987) According to dividend signalling hypothesis increasing dividend signals to market a strong future financial performance of the firm and decreasing dividend signalling the opposite

(Dasilas et al. 2008; Hasan 2022). Based on this, trading volume should increase when the firm announces an increasing dividend since investors are willing to take an advantage to benefit of the stock ownership. Based on this we form the fourth research hypothesis as follows:

H4: Trading volume of the stock increases on the announcement day, if the firm announces increasing dividend

As discussed previously, constant dividend announcement should not provide any new or valuable information to market. Thus, any effect on trading volume should not be noticed. The fifth research hypothesis of this study is:

H5: Constant dividend announcement does not have an effect on trading volume of the stock

In the contrary, to dividend increases, trading volume is expected to decrease when the firm announces a decreasing dividend since market prices these announcements opposite thus seeing dividend decreases as bad news from the firm. Previous research has also showed evidence that trading volume moves to the same direction as the dividend changes. (Dasilas & Leventis 2011) Therefore the sixth research hypothesis of this study is formed as follows:

H6: Trading volume of the stock decreases on the dividend announcement day, if the firm announces decreasing dividend

According to dividend signalling hypothesis stock market reactions are more pronounced for smaller firms than for larger firms due to signalling measure of the future growth potential. It is also argued that event-induced trading follows differential belief revisions suggesting that smaller firms are expected to have higher increase in trading. (Günther 2017) The last two research hypotheses focus on to examine the market value-based effects. The research hypotheses are formed as follows:

H7: The stock price reaction following the dividend announcement is more pronounced for mid-cap firms compared to large-cap firms

H8: The trading volume response of the stock following the dividend announcement is more pronounced for mid-cap firms compared to large-cap firms

4 Data and methodology

In this chapter the data used for this study and the chosen method to research the stock market reaction on the dividend announcements is discussed. Event study methodology is used to examine the stock price reaction on dividend change announcements and to examine the trading volume responses on the announcements during the previously mentioned 11-day event window. All the data used for this study is gathered from Refinitiv. The dividend announcements are gathered from January 2018 to December 2022 covering 5-year research period.

Daily adjusted closing prices and trading volume data are obtained for firms listed in Nasdaq Nordic, including listed firms in OMX Helsinki, OMX Stockholm and OMX Copenhagen. Due to small amount of dividend announcements for listed firms in OMX Iceland and due to data availability, this exchange is excluded from this study. In this study only firms listed in OMX Nordic Large Cap Index and OMX Nordic Mid Cap Index are investigated. Firms listed to these stock indices pay dividends frequently which is one precondition regarding the research sample to this study. Thus, the small and micro-cap firms are excluded from this sample. It is argued that smaller firms do not have as much focus on dividends since they are more willing to invest their free cash flow for future growth potential than sharing it straight to shareholders through dividend payments (Redding 1997). By including the listed firms of these indices also allow to gather data from substantial large set of firms and thus providing more reliable results. The benchmark index used in this study is OMX Nordic 40 which includes 40 most traded stocks in Nordic markets. The index includes stocks from four Nordic stock markets, Helsinki, Stockholm, Copenhagen, and Iceland. For country level research OMX Helsinki 25 Index, OMX Stockholm 30 Index and OMX Copenhagen 20 Index are used separately to examine the differences between each exchange. The previously mentioned indices include the largest and the most traded stocks of each exchange and are therefore well suitable for this study. The developments of the indices can be seen below in figure 2.

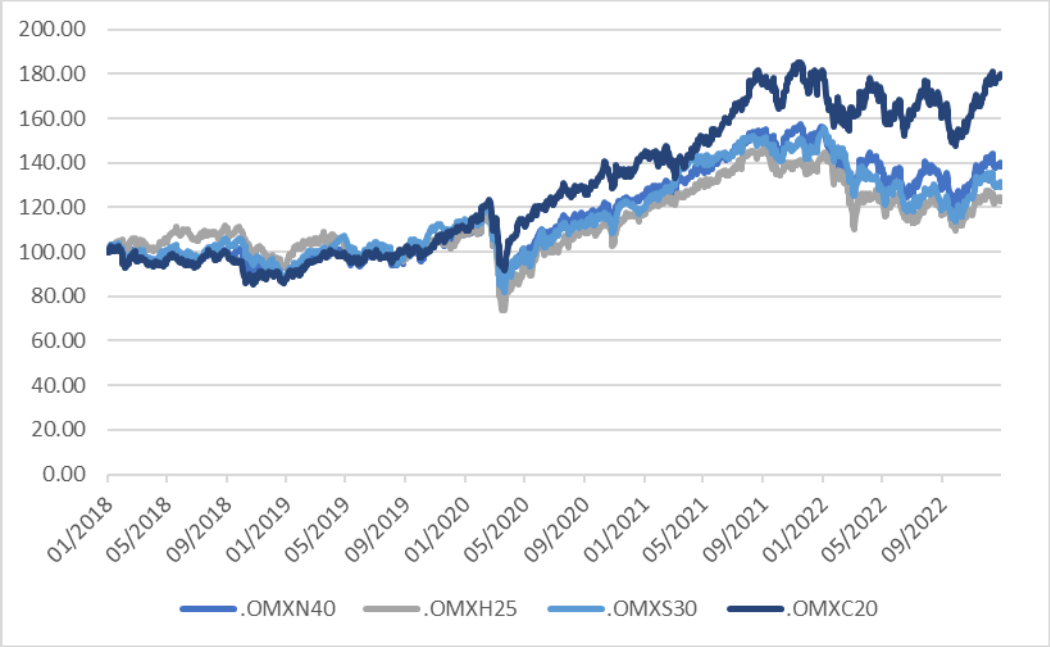

Figure 2 Developments of the Indices during 2018–2022

This study includes only dividend announcements that are available in Refinitiv. The announcement dates in Refinitiv are the dates when the board announces the proposed dividend for the very first time. One of the challenges in this study is that most of the Nordic firms announce the dividends combined with earnings announcements. Therefore, it is impossible to isolate the effect of dividend announcement change on stock prices from the effect of earnings announcements. Thus, even though the significant effect on stock prices on and around the event day is found the results must be considered critically since it is not certain that this effect is solely caused by announced dividend changes. Regarding the sample of this thesis, all the events are checked and those that have other simultaneously events, such as stock splits, buybacks etc., occurring during the event window are excluded from the sample. Thus, the final sample of this study consists of firms that have announced dividend announcements or joint dividend and earnings announcements. This study focuses on to research only final cash dividend announcements, thus all the other types of dividend announcements are excluded from this study. Several firms in the sample have issued shares in two classes and differ only with the respect to voting rights. In this study, only B shares from firms that have issued two classes of shares are included. B shares are generally the most liquid class of shares and are thus more suitable to this study. Requirements for each firm of this study are summarized below.

- Firm is listed or has been listed in NASDAQ Nordic stock exchange, either OMX Helsinki, OMX Stockholm or OMX Copenhagen during 2018−2022 sample period.
- Firm is listed or has been listed either OMX Nordic Large Cap Index or OMX Nordic Mid Cap Index during 2018−2022 sample period.
- Data for firm is available for sample period 2018−2022 and for estimation and event period of each event.
- Firm has announced dividends during the sample period, 2018−2022.
- Firm has not announced any other significant news except dividend and earnings announcements during the event window.

After data validation the total sample of this study consists of 977 dividend change announcements by 253 firms. A list of the firms included in this study can be seen in Appendix 2.

Table 2 Dividend change announcements 2018-2022

	Dividend Increase	Constant Dividend	Dividend Decrease	Total
Denmark	90	46	36	172
Finland	87	23	38	148
Sweden	404	103	150	657
Total	581	172	224	**977**

Table 2 shows the dividend announcements in Nordic market during 2018−2022. In total there are 977 dividend change announcements, including 581 dividend increase announcements, 172 constant dividend announcements and 224 dividend decrease announcements. As we can see, the firms seem to favour dividend increases implying that managers are willing to signal positive future prospects of the firm. The amount of announced dividend increases is over triple compared to constant announcements, and double compared to dividend decrease announcements. If we look at the table in country level, the number of announced dividends is higher in Sweden compared to Denmark and Finland. One thing to consider is that substantially many announcements were excluded in Finland due to other significant news of the firm during the event window. Sweden has also the largest capital market of the three Nordic countries under investigation. It is also argued

that Sweden focuses more on dividend growth compared to other Nordic countries and aims to increase the paid dividend (Brunzell et al. 2014). Overall, in Sweden there are 657 announced dividends, including 404 dividend increase announcements, 103 constant dividend announcements and 150 dividend decrease announcements. The results of this study are consistent with the Brunzell et al. (2014) who argue that in Sweden the firms favour dividend increase announcements over other dividend announcements. As mentioned, firms seem to favour dividend increases over other announcements, but the announced increase announcements are substantially lower in Denmark and Finland compared to Sweden. In Finland firms favour less constant dividend announcements which is consistent with the results in Sweden. However, in Denmark firms seem to favour dividend decreases less over other dividend change announcements.

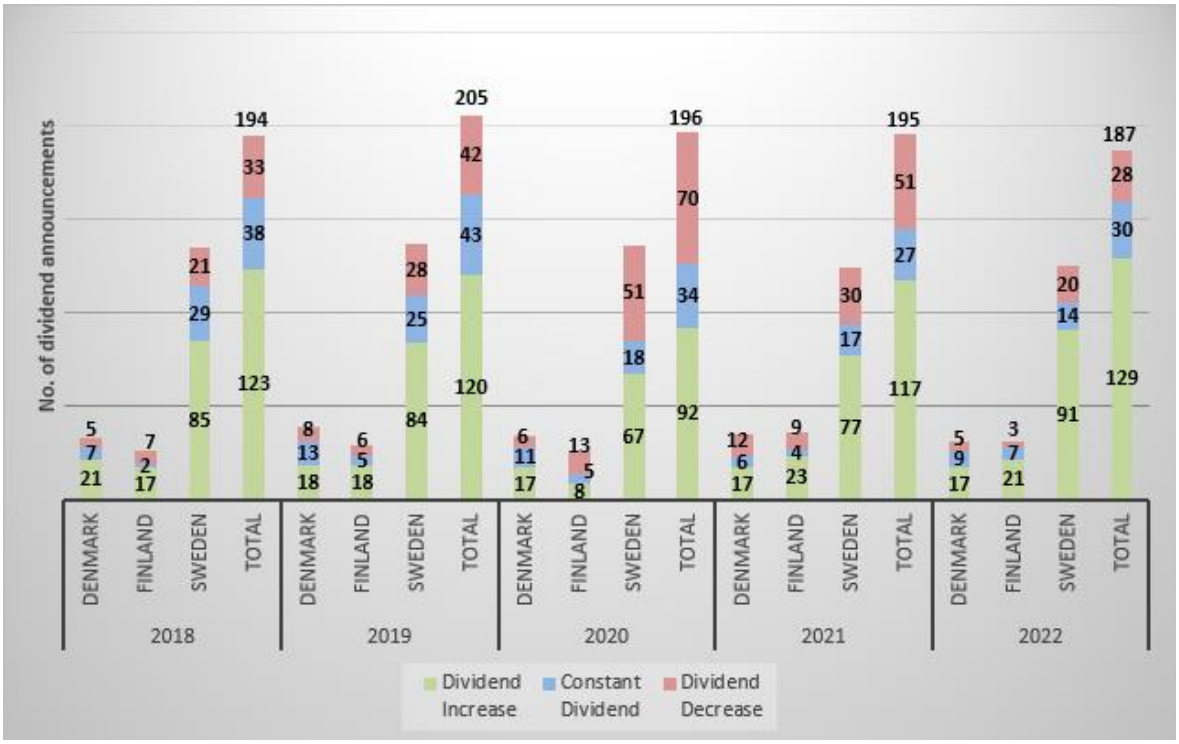

Figure 3 Dividend announcement distribution during 2018-2022

Figure 3 shows the dividend announcement distribution between 2018−2022. Overall, there are approximately 200 dividend announcements each year, the peak in 2019 and the lowest amount in 2022. From the figure we can notice some COVID-19 effects on the dividend announcements. In Sweden, 2019 there are 84 dividend increase announcements which is

almost same as 2018. In 2020, Swedish firms have announced 67 dividend increases and dividend decrease announcements almost double compared to 2019. Similar effects can be seen in Finland, where firms have announced decreasing dividend twice as much as previous year. Unlike in Finland and Sweden, in Denmark firms have although announced dividend increases on the same level as previous years, but dividend decrease amount is double in 2021 compared to 2020. Considerable is that the total amount of announced dividends remains almost same level during the crisis period compared the time before. According to figure 3, it seems that crisis has some negative effects on firm's dividend policy and is reflected to the firm's ability to pay higher dividend during crisis period. According to Linden et al. (2021) lower dividend is a consequence of the firm's aim to keep larger cash reserves during the crisis and not due to firm's lower profitability. It should still be considered that some of the events have been excluded from this study and are not included in this analysis. Cancelled dividend announcements are also excluded from this sample and these amounts might have been increased during crisis period. Therefore, the COVID-19 effect might in fact be even more significant.

As discussed, the aim of this study is to research the stock market behaviour on different dividend announcements. For this purpose, the sample is divided into three different groups, dividend increases, dividend decreases and constant dividends. In addition, the aim is to research stock market behaviour at country level and in addition to examine whether there are any differences between each exchange. For this purpose, the sample is divided further into four different groups, first of them including all observations, and other three including each exchange separately.

4.1 Descriptive statistics

In table 3, we can see descriptive statistics of firm level variables. These variables are paid dividend, dividend yield, dividend payout ratio, market capitalization, retained earnings and turnover. In this thesis the focus of these variables is on market capitalization which is used to examine differences between mid-cap firms and large-cap firms. Market capitalization is defined as a total market value of outstanding shares of the firm which is used to define the size of the firm. It is measured by multiplying the number of all the outstanding shares by the current market value of one share. In this study, turnover is used as a measurement of

trading volume. It is measured by dividing the total number of traded shares during certain period by the number of the outstanding shares during the same period. Other variables are introduced to provide overall information of the firms included in this study. The dividend is measured in local currencies.

Table 3 Descriptive statistics

DENMARK	*DIVIDEND*	*DIVIDEND YIELD (%)*	*DIVIDEND PAYOUT RATIO (%)*	*MARKET CAP*	*RETAINED EARNINGS*	*TURNOVER*
N=172						
MEAN	27.75	4.42 %	71.85 %	9244.13	2550.34	14.63
MEDIAN	1250.06	3.00 %	76.12 %	8586.6	2443.23	12.47
MIN	0.11	1.87 %	20.47 %	51.20	1.99	2.90
MAX	2500	10.91 %	146.05 %	289509.35	36758.35	162.26
STANDARD DEVIATION	192.41	3.92	52.92	3004.47	468.63	10.01
FINLAND	***DIVIDEND***	***DIVIDEND YIELD (%)***	***DIVIDEND PAYOUT RATIO (%)***	***MARKET CAP***	***RETAINED EARNINGS***	***TURNOVER***
N=148						
MEAN	0.53	2.91 %	94.90 %	4269.84	1744.48	8.40
MEDIAN	0.98	2.84 %	77.12 %	851.82	1745.45	7.00
MIN	0.01	1.82 %	49.71 %	11.30	-498.00	1.80
MAX	1.95	4.19 %	201.59 %	52308.02	29937.00	1289.62
STANDARD DEVIATION	0.45	0.98	64.91	928.43	139.31	6.67
SWEDEN	***DIVIDEND***	***DIVIDEND YIELD (%)***	***DIVIDEND PAYOUT RATIO (%)***	***MARKET CAP***	***RETAINED EARNINGS***	***TURNOVER***
N=657						
MEAN	3.05	2.86 %	45.00 %	4178.33	1606.54	8.40
MEDIAN	7.28	2.75 %	39.00 %	3885.87	1599.33	7.10
MIN	0.05	1.86 %	17.00 %	31.71	-876.33	1.00
MAX	14.5	4.15 %	85.00 %	70503.08	63973.58	99.57
STANDARD DEVIATION	2.32	0.96	28.19	1312.16	329.52	6.20

4.2 Event study methodology

Event study has a long history, and it is a widely accepted method in financial market research while investigating impact of a specific event on the value of a firm. According to MacKinlay (1997) the usefulness of the event study comes from the fact that the effects of an event should be reflected in security prices without any delay. Overall, the event study

measures the abnormal changes in stock prices of publicly traded firms that occur in conjunction with the event. Previous research has argued that the method relies at some level to an assumption that the stock prices can be at least partially predicted. The actual return of the stock is measured over the period of interest, after that the difference between the predicted returns and actual returns is computed. If the measured difference between the predicted returns and actual returns differs statistically from zero, it can be concluded that the event has significant effect on the stock prices and investors react to this event. (Wells 2004)

The event study starts by identifying the event and the event period which the stock prices of the involved firms are investigated. This is referred to an event window. (MacKinlay 1997; Wells 2004) The event window should include at least the event day, but it is customary to define the window to be larger than the specific date of interest. (MacKinlay 1997) The most common length of the event window is either 11− day or 21−day (Brown & Warner 1985). In addition to the event window the estimation window must be defined as well. This is most often 120−250 days prior the event date. (Brown & Warner 1985; MacKinlay 1997) In this thesis the event day is the dividend announcement date and the stock market reaction on the event is investigated in 11−day event window. This enables to capture the stock price effects of the announcement also after and prior the actual event date. The estimation window used in this study is 250 days prior the event day. Event study timeline for this study can be seen below in Figure 4.

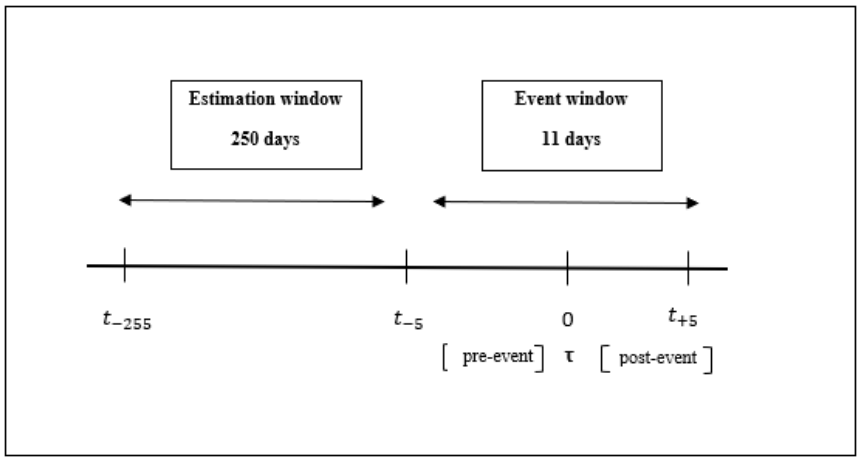

Figure 4 Event Study timeline

The measurement of the abnormal returns is necessary for investigating the effect of the event under interest on stock prices. The abnormal return is defined as the difference of the actual ex-post return of the stock over the event window and the normal return of the firm over the event window. The normal return of the firm is defined as the expected return without the event of interest. The abnormal return for any given firm *i* and the event date τ is:

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau}|X_\tau) \quad (3)$$

Where $AR_{i\tau}$ is the abnormal return, $R_{i\tau}$ is the actual return and $E(R_{i\tau}|X_\tau)$ is the normal return for time τ. In formula 3, the $X_\tau$is the conditioning information for the normal return model. (MacKinlay 1997) The measurement of expected returns can be formed with several different methods, including the constant mean return model, the market adjusted return model and the market model (Brown & Warner 1985; MacKinlay 1997). The constant mean return model assumes that the mean return is constant through time for a given security. The relation between the return of the security and the market return is assumed to be linear over time which differs from the market model approach. It is argued that the market model represents improvement over the constant mean return model. The third model, the market adjusted return model can be seen as a restricted version of the market model since the Alpha (α) is restricted to be zero and Beta (β) to one. (MacKinlay 1997) Previous research has widely supported the market model approach for measuring the expected returns (Armitage 1995). In the market model the portion of the return related to variation in the market return is reduced, thus reducing the variance of the abnormal returns. This is argued to lead to an increased ability to observe event effects. (MacKinlay 1997).

4.2.1 Measuring normal and abnormal returns

According to previous research the market model approach has been the best to model the expected returns due to its ability to observe the event effects (Armitage 1995; MacKinlay 1997). Wells (2004) argues also that the market model approach is more sophisticated model that incorporates a risk adjustment component in return estimation. In this study the market model approach is used to measure the expected returns of each stock. For the robustness check the market adjusted return model is also used as a separate model to measure the expected returns. From now on the market model approach is used and the corresponding

returns estimation and the results for the market adjusted return model are reported in Appendices. The study starts by determining the returns for each firm *i* and the market return *m*. Daily adjusted closing stock prices are used for return estimation with the following formula:

$$R_{it} = \ln\left(\frac{P_{it}}{P_{it-1}}\right) \quad (4)$$

Where R_{it} is the actual return for firm *i* at time *t*, P_{it} is the closing price at time *t* for firm *i* and P_{it-1} is the previous day's closing price for firm *i* at time $t-1$. In formula 4, *ln* is the natural logarithm. Similarly, the same pattern is followed for calculating the market return, except the R_{it} is replaced by R_{mt} :

$$R_{mt} = \ln\left(\frac{P_{mt}}{P_{mt-1}}\right) \quad (5)$$

In formula 5, R_{mt} is the market return *m* at time *t*. P_{mt} is the closing price at time *t* for market *m* and P_{mt-1} is the previous day's closing price at time $t-1$. After measuring the actual returns for market *m* and each stock, α and β are measured from daily actual returns for each firm. The following market model regression is used for the estimation:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (6)$$

Where R_{it} and R_{mt} are the returns for stock *i* and the market *m* respectively at time *t*. α_i and β_i are the Alpha and Beta parameters of the market model, and ε_{it} is the error term. In this study, 250-days estimation period is used for the estimation. The expected returns are estimated for each day during the estimation window and the event window. For this purpose, the Capital Asset Pricing Model (CAPM) is used:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (7)$$

In formula 7, R_{it} is the expected return for stock *i* at time *t* and R_{mt} is market return *m* at time *t*. α_i and β_i are the market model parameters and ε_{it} is the zero mean disturbance term. After estimating the expected returns, the following stage is to estimate the daily abnormal returns:

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt} \quad (8)$$

Where AR_{it} is the daily abnormal return for the stock *i* at time *t*. The next stage is to estimate the average abnormal return (AAR) of each day during the event window with the following formula:

$$\mathrm{AAR_t} = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \tag{9}$$

In formula 9, $\mathrm{AAR_t}$ is the average abnormal return at time *t* and *N* is event number which is in this study the number of dividend announcements. AR_{it} is the abnormal return for each stock *i* at time *t*. In this study, the aim is also to investigate behaviour of the returns during certain period in addition to individual daily returns. For this purpose, the cumulative abnormal return (CAR) is estimated which aggregates the returns through time. CAR is the sum of abnormal returns from period t_1 to t_2:

$$CAR(t_{1,}t_2) = \sum_{t=t_1}^{t_2} AR_t \tag{10}$$

In formula 10, $CAR(t_{1,}t_2)$ is the cumulative abnormal returns from period t_1 to t_2 and AR_t is the abnormal return at time *t*. Similarly, to abnormal returns, the cumulative average abnormal return (CAAR) is estimated in order us to make general assumptions based on the results. CAAR is estimated with the following formula:

$$CAAR(t_{1,}t_2) = \frac{1}{N}\sum_{i=1}^{N} CAR_i(\,t_{1,}t_2) \tag{11}$$

Where $CAAR(t_{1,}t_2)$ is the cumulative average abnormal return from period t_1 to t_2 and *N* is the event number which is in this study number of dividend announcements.

4.2.2 Statistical testing

Previous research has widely favoured t−test over other methods in statistical testing of the abnormal returns (Armitage 1995). In this study, the cross-sectional t-test based on t-distribution is used to test the statistical significance of the abnormal returns. The null hypothesis (H0) is that the event of interest has no effect on the stock returns. The test statistic for the individual daily abnormal returns is:

$$t_{AAR_t} = \sqrt{N}\frac{AAR_t}{\sigma_{AAR_t}} \quad (12)$$

Where AAR_t is the average abnormal return at time *t*, *N* is the number of dividend announcements and σ_{AAR_t} is the standard deviation of the abnormal returns at time *t* defined as a square root of the sample variance:

$$\sigma^2_{AAR_t} = \frac{1}{N-1}\sum_{i=1}^{N}(AR_{i,t} - AAR_t)^2 \quad (13)$$

In formula 13, *N* is the number of dividend announcements. The test statistic for testing the statistical significance of the cumulative abnormal returns is:

$$t_{CAAR_t} = \sqrt{N}\,\frac{CAAR(t_1,t_2)}{\sigma_{CAAR_{(t_1,t_2)}}} \quad (14)$$

Where $CAAR(t_1,t_2)$ is the cumulative average abnormal return from period t_1 to t_2, *N* is the number of dividend announcements and $\sigma_{CAAR_{(t_1,t_2)}}$ is the standard deviation of the cumulative abnormal returns from period t_1 to t_2 defined as a square root of sample variance:

$$\sigma^2_{CAAR_{(t_1,t_2)}} = \frac{1}{N-1}\sum_{i=1}^{N}(CAR_t - CAAR_t)^2 \quad (15)$$

Welch's test is used to test statistical differences between the sample groups. The Welch's test is selected to event effect comparison since it is more reliable in analysis when two samples have unequal variances and sample sizes. The idea behind the test is to test whether the means of two samples are equal. (Welch 1938) The Welch t-statistics is defined as follows:

$$t = \frac{m_A - m_B}{\sqrt{\frac{\sigma_A^2}{N_A} + \frac{\sigma_B^2}{N_B}}} \quad (16)$$

In formula 16, m_A and m_B are the means of the samples A and B respectively. σ_A^2 and σ_B^2 are the standard deviations of the sample groups A and B, and N_A and N_B are the sample sizes of the samples A and B respectively.

4.2.3 Problems with event study

According to MacKinlay (1997) one of the problems with the event study method is that the new information might have reached the market already prior the event day. Therefore, the reaction on the event day might have already been reflected to stock prices already prior the actual event day. (MacKinlay 1997) Previous research has also argued that the major problem is the definition of the event day. According to Vaihekoski (2004) the decision making of the exact event day of dividend announcement is usually made between the proposal date of the dividend and the final decision in the general meeting. The event study assumes also that the events are distinct from other events. However, it is not unusual that several corporate news is announced at the same time by the firm's management. Thus, the market reaction might be a consequence of other events or combined effect from all the announced news rather than the event of interest. (Vaihekoski 2004, 236)

It is argued that the event study assumes that the market model beta is constant through time (Wells 2004). However, previous research has showed that betas might differ between event window and estimation window. Therefore, the assumption of constant beta might falsify the results. (Armitage 1995) Usually daily stock prices used in the event study are daily closing prices of the stocks. MacKinlay (1997) argues that this assumption implicitly assumes that the stock prices are equal at 24-hour interval and therefore the trading of the stock is ignored which might affect the results.

4.3 Measuring abnormal trading volumes

Daily turnover is used as a measurement of each stock's trading volume. The relation of individual firm trading activity to market activity and the ability of the benchmark to exclude anomalous trading can be measured with a common market model approach presented in sub-section 4.2.1. Similarly like for the abnormal returns the market adjusted return model is used as a separate model for the comparison. According to Tkac (1999) the market model is widely used in empirical studies of event-related trading activities and is formed of running a time-series regression for each firm:

$$E(TV_{it}) = \alpha_i + \beta_i TV_{mt} + \varepsilon_{it} \quad (17)$$

Where $E(TV_{it})$ is the expected trading volume for stock *i* at time *t* and TV_{mt} is market trading volume at time t. α_i and β_i are the market model parameters and ε_{it} is the zero mean disturbance term. After estimating the expected trading volumes, the following stage is to estimate the daily abnormal trading volumes:

$$AV_{it} = TV_{it} - \alpha_i - \beta_i TV_{mt} \quad (18)$$

In formula 18, AV_{it} is the daily abnormal trading volume for the stock *i* at time *t*. Similarly, as the average abnormal returns were estimated for each stock, the average abnormal trading volumes (AAV) can be estimated for each day on the event window. Average abnormal trading volumes are estimated with the following formula:

$$\mathrm{AAV_t} = \frac{1}{N}\sum_{i=1}^{N} AV_{it} \quad (19)$$

Where $\mathrm{AAV_t}$ is the average abnormal trading volume at time *t* and *N* is event number which is in this study the number of dividend announcements. AV_{it} is the abnormal trading volume for each stock *i* at time *t* calculated in formula 18. Similarly, to abnormal trading volumes, we estimate the cumulative average abnormal trading volume (CAAV):

$$CAAV(t_1, t_2) = \frac{1}{N}\sum_{i=1}^{N} CAV_i(t_1, t_2) \quad (20)$$

Where $CAAV(t_1, t_2)$ is the cumulative average abnormal trading volume from period t_1 to t_2. The similar approach as presented in section 4.2.2 is used for the statistical testing.

5 Empirical results

The short-term stock market reaction on different dividend change announcements was examined via two different approaches of the one capturing the stock price reaction and the second trading volume responses on dividend change announcements. The same length of estimation and event window were used for both approaches. In this section only the results from the market model approach are presented whereas the corresponding results from the market adjusted return model are reported in Appendices 4−7. According to the results there are not any significant differences between the models. The event study was first executed for full sample investigating dividend increases, constant dividends and dividend decreases announcements separately. Next the same process was executed for announcements in Denmark, Finland, and Sweden to capture event effects separately in each Nordic country. The statistical significance was tested for daily average abnormal returns (AAR) on each day during the event window and for cumulative average abnormal returns (CAAR) on seven different periods. Following the same approach, the same process was repeated for daily average abnormal trading volumes (AAV) and for cumulative average abnormal trading volumes (CAAV). Section 5 ends by analyzing the differences between mid-cap firms and large-cap firms, concluding the market cap effects on the abnormal returns and on the abnormal trading volumes.

5.1 Stock price reaction on dividend announcements

Table 4 shows the results of the daily average abnormal returns on each day during the event window. The results on the event day are statistically significant at the 1 % level for dividend increases including all dividend increase announcements. The results suggest a positive 0.63 % AAR on the dividend increase announcement day which is consistent with the findings by Dasilas & Leventis (2011) who show 0.5 % abnormal return on the event day. Similar results can be noticed in Denmark and Sweden as well, where the abnormal returns on the dividend increase announcement day are also positive and statistically significant but unlike for full sample, they are statistically significant at the 5 % level. Notable is that in Denmark the abnormal return is double compared to full sample and Sweden, 1.21 %. The results of

this study are partially consistent with the findings of Liljeblom et al. (2015) who report statistically significant and positive abnormal returns on dividend announcements in Sweden but statistically insignificant results in Denmark. According to the results of this thesis, the Finnish stock market seems to react in advance for dividend increase announcements. The results suggest a positive and statistically significant abnormal return three and one day before the event day. Table 4 shows that the stock market seems to react in advance in all three Nordic countries. This is consistent with the findings by Günther (2017) who report statistically significant abnormal returns also during the pre-event window. Close to event day the abnormal returns are positive for all sample groups but on the post-event window, the abnormal returns turn negative substantially soon after the event day. The results of this thesis suggest that market processes the new information rather slowly in case of dividend increases since we can observe statistically significant AARs even five days after the event day. This is consistent with the findings by Al-Shattarat et al. (2013) who report overreaction in stock prices straight after the event day. Statistically significant and negative AARs during the post-event period might imply that the stock prices drop shortly after the dividend announcement. According to Legenzova et al. (2017) stock prices should decrease by the dividend amount on the ex-dividend day in perfectly efficient capital markets. This implies that AARs could be obtained only when selling shortly after the dividend announcement day since longer wait would result in drop in the price of the stock. (Legenzova et al. 2017) Although, this is related to tax effect of the dividend income since investors are posed to different taxation regarding dividend and capital incomes (Mori 2010). In this study, Finland is only country with favourable tax treatment regarding the dividend income.

According to dividend signalling hypothesis we should not notice any statistically significant abnormal returns for constant dividend announcements. The results of this study are consistent with the theory for total sample and results in Denmark and Sweden since any statistically significant abnormal returns are not noticed. However, the Finnish stock market seems to react significantly on the event day and one day after showing -2.86 % AAR on the event day which is statistically significant at the 5 % level. The findings indicate that investors in Finland prices the constant dividend announcements differently and interpret the constant dividend as a negative news from the firm. This might imply that Finnish investors who prefer growing dividend and seek for growing stocks see the constant dividend as a lack of the growth potential of the firm. According to the results Denmark is the only one showing

positive abnormal return on the event day for constant dividend announcements, although statistically insignificant.

Table 4 Daily average abnormal returns (AAR) of the dividend announcements. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample			*Denmark*			*Finland*			*Sweden*		
DAYS	***AAR %***		***t-statistics***	***AAR %***		***t-statistics***	***AAR %***		***t-statistics***	***AAR %***		***t-statistics***
						Dividend Increases						
-5	-0.26 %	***	-3.26	-0.04 %		-0.16	-0.21 %		-1.23	-0.33 %	***	-3.49
-4	-0.21 %	***	-2.62	-0.28 %		-1.49	-0.15 %		-0.81	-0.22 %	**	-2.13
-3	-0.09 %		-1.07	-0.48 %	**	-2.28	0.60 %	***	3.77	-0.12 %		-1.16
-2	0.09 %		1.09	-0.07 %		-0.41	0.17 %		0.81	0.12 %		1.18
-1	0.31 %	***	3.02	0.55 %		1.51	0.52 %	***	2.51	0.27 %	***	2.65
0	0.63 %	***	2.80	1.21 %	**	2.08	0.02 %		0.04	0.67 %	**	2.40
1	0.24 %	*	1.89	0.15 %		0.52	0.17 %		0.52	0.27 %	*	1.71
2	-0.25 %	**	-2.20	-0.71 %	*	-1.84	-0.20 %		-0.84	-0.14 %		-1.15
3	0.00 %		0.01	-0.17 %		-0.76	-0.20 %		-0.95	0.10 %		0.97
4	-0.20 %	**	-2.26	0.26 %		1.01	-0.26 %		-1.42	-0.27 %	**	-2.55
5	-0.51 %	***	-6.24	-0.29 %		-1.25	-0.34 %		-1.57	-0.57 %	***	-6.03
						Constant Dividends						
-5	0.32 %		0.71	2.07 %		1.26	-0.30 %		-1.07	-0.26 %		-1.44
-4	-0.37 %		-0.91	-0.88 %		-0.59	-0.49 %		-1.47	-0.05 %		-0.20
-3	-0.03 %		-0.21	-0.12 %		-0.31	-0.40 %		-0.93	-0.01 %		-0.07
-2	0.25 %		1.48	0.64 %		1.42	0.35 %		1.04	0.21 %		1.00
-1	-0.05 %		-0.32	-0.42 %		-1.22	0.36 %		1.23	0.01 %		0.04
0	-0.59 %		-1.20	0.51 %		0.64	-2.86 %	**	-2.25	-0.61 %		-0.91
1	-0.38 %		-1.61	-0.14 %		-0.31	-1.34 %	**	-2.29	-0.30 %		-0.96
2	-0.04 %		-0.09	-0.78 %		-0.50	0.67 %		1.09	0.18 %		0.65
3	-0.03 %		-0.16	-0.04 %		-0.13	0.63 %		1.21	-0.14 %		-0.50
4	0.39 %		0.89	1.46 %		0.99	-0.70 %	*	-1.99	0.13 %		0.56
5	-0.63 %		-1.44	-1.61 %		-1.04	-0.38 %		-0.81	-0.12 %		-0.68
						Dividend Decreases						
-5	-0.21 %		-1.33	0.30 %		0.96	0.19 %		0.64	-0.36 %	*	-1.70
-4	-0.18 %		-1.33	-0.11 %		-0.36	0.07 %		0.16	-0.26 %	*	-1.67
-3	-0.35 %	**	-2.21	-0.23 %		-0.74	0.05 %		0.15	-0.50 %	**	-2.39
-2	0.18 %		1.25	0.43 %		1.49	0.57 %	*	1.92	-0.01 %		-0.03
-1	0.25 %		1.43	0.19 %		0.49	0.42 %	*	1.75	0.24 %		1.01
0	-0.80 %	**	-2.01	-0.45 %		-0.48	-0.65 %		-0.85	-0.87 %	*	-1.71
1	0.04 %		0.19	1.24 %	***	2.89	-0.86 %	*	-1.77	-0.07 %		-0.22
2	-0.18 %		-1.06	0.37 %		0.83	0.19 %		0.42	-0.37 %	*	-1.88
3	-0.13 %		-0.92	-0.50 %	**	-2.16	0.10 %		0.33	-0.12 %		-0.63
4	-0.37 %	***	-2.84	0.23 %		0.68	-0.71 %	**	-2.15	-0.38 %	**	-2.43
5	-0.09 %		-0.70	-0.20 %		-0.76	-0.23 %		-0.48	0.00 %		0.00

In addition, table 4 shows that Nordic market seems to react negatively and significantly on dividend decrease announcements. The results suggest AAR of -0.80 % for the full sample which is statistically significant at the 5 % level. Similar results can be seen in Sweden but the Swedish results are statistically significant only at the 10 % level. We can also notice negative and statistically significant AARs on both pre-event window and post-event window periods. Similar results can be seen in all groups, except in Denmark where there are not any statistically significant AARs in pre-event window. Notable is that in Denmark the stock market reacts positively even one day after the event day, suggesting 1.24 % AAR which is statistically significant even at the 1 % level. The Finnish stock market seems to react more negatively for constant dividend announcements compared to dividend decrease announcements. The results suggest -0.65 % AAR on the dividend decrease announcements which is statistically insignificant whereas the corresponding result for constant dividend announcements is -2.86 % with the significance level 5 %.

In table 5 we can see the cumulative average abnormal returns of the dividend change announcements. In this study, seven different periods were used for investigating the cumulative abnormal returns. The effect of dividend announcements on stock prices is more intense when we examine the CAARs. We can notice positive CAARs on the event day and both pre-event and post-event periods for full sample. Similar results can be seen for Denmark and Sweden as well. Notable is that CAARs are higher in Denmark compared to results for total sample and in Sweden. In Denmark results suggest CAAR 1.92 % for period [-1, +1] whereas in Sweden CAAR for corresponding period is 1.21 % and for full sample 1.18 %. Similarly post-event CAAR for period [0, +1] is 1.36 % in Denmark, whereas in Sweden it is 0.94 % and for full sample 0.87 %. The results from Finland differs substantially from results in Denmark and Sweden. We report statistically significant CAAR for dividend increases only in pre-event period implying that in Finland stock market seems to react to dividend increase announcements in advance. The results of this thesis indicate that investors see dividend increase announcements as positive news and support the dividend signalling hypothesis. Stock market seems to react significantly for constant dividend announcements only in Finland where we can notice statistically significant results also both pre-event and post-event periods. The CAARs are also substantially higher compared to other sub-sample groups. Table 5 shows that CAARs for dividend decreases are significant on the post-event window for full sample and Swedish sub-sample. Contrary, results suggest significant

CAARs for Finnish sub-sample only during the pre-event window, while showing insignificant CAARs for Danish sub-sample.

Table 5 Cumulative average abnormal returns (CAAR) of the dividend announcements. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample			*Denmark*			*Finland*			*Sweden*		
[t1,t2]	***CAAR %***		***t-statistics***	***CAAR %***		***t-statistics***	***CAAR %***		***t-statistics***	***CAAR %***		***t-statistics***
						Dividend Increases						
[-5,-1]	-0.16 %		-0.92	-0.32 %		-0.68	0.92 %	**	2.00	-0.28 %		-1.38
[-3,-1]	0.31 %	**	2.15	0.00 %		-0.01	1.29 %	*	3.61	0.27 %	*	1.77
[-1,+1]	1.18 %	***	4.16	1.92 %	**	2.45	0.70 %		1.19	1.21 %	***	3.58
[0,0]	0.63 %	***	2.80	1.21 %	**	2.08	0.02 %		0.04	0.67 %	**	2.40
[0,+1]	0.87 %	***	3.34	1.36 %	**	2.29	0.18 %		0.35	0.94 %	***	2.85
[0,+3]	0.62 %	**	2.15	0.48 %		0.78	-0.21 %		-0.33	0.90 %	**	2.47
[0,+5]	-0.09 %		-0.27	0.46 %		0.58	-0.80 %		-1.17	0.07 %		0.16
						Constant Dividends						
[-5,-1]	0.11 %		0.17	1.28 %		0.56	-0.49 %		-0.55	-0.11 %		-0.27
[-3,-1]	0.16 %		0.67	0.09 %		0.18	0.31 %		0.51	0.20 %		0.66
[-1,+1]	-1.02 %	**	-1.99	-0.05 %		-0.06	-3.84 %	**	-2.61	-0.90 %		-1.32
[0,0]	-0.59 %		-1.20	0.51 %		0.64	-2.86 %	**	-2.25	-0.61 %		-0.91
[0,+1]	-0.97 %	*	-1.76	0.37 %		0.42	-4.20 %	**	-2.80	-0.91 %		-1.23
[0,+3]	-1.04 %		-1.53	-0.45 %		-0.28	-2.91 %	*	-2.06	-0.87 %		-1.05
[0,+5]	-1.28 %		-1.40	-0.59 %		-0.21	-3.99 %	**	-2.47	-0.85 %		-1.04
						Dividend Decreases						
[-5,-1]	-0.31 %		-0.87	0.58 %		0.77	1.29 %	**	2.13	-0.88 %	*	-1.85
[-3,-1]	0.08 %		0.30	0.39 %		0.65	1.04 %	**	2.22	-0.26 %		-0.73
[-1,+1]	-0.50 %		-0.95	0.98 %		0.96	-1.09 %		-0.98	-0.70 %		-1.01
[0,0]	-0.80 %	**	-2.01	-0.45 %		-0.48	-0.65 %		-0.85	-0.87 %	*	-1.71
[0,+1]	-0.75 %		-1.60	0.79 %		0.85	-1.51 %		-1.44	-0.94 %		-1.55
[0,+3]	-1.07 %	**	-2.04	0.66 %		0.73	-1.22 %		-0.97	-1.43 %	**	-2.11
[0,+5]	-1.53 %	***	-2.72	0.69 %		0.71	-2.16 %		-1.41	-1.81 %	**	-2.56

5.1.1 Development of the abnormal returns

In figure 5 we can see the development of CAARs of dividend increase announcements during the event window for each group separately. For all groups we can notice increase in CAARs starting from three days prior the event day. In Finland we can notice increase in CAAR even four days prior the event day. This indicates that stock markets seem to at least some level react to news in advance. Overall, the results are not economically statistically

significant showing considerable low CAARs around the dividend increase announcements. In addition, if the possible transaction costs are considered the abnormal returns are not that significant either since they decrease the return. Notable is that the CAARs seem to turn downwards quite soon after the event day implying that the market processes the news economically in an efficient manner.

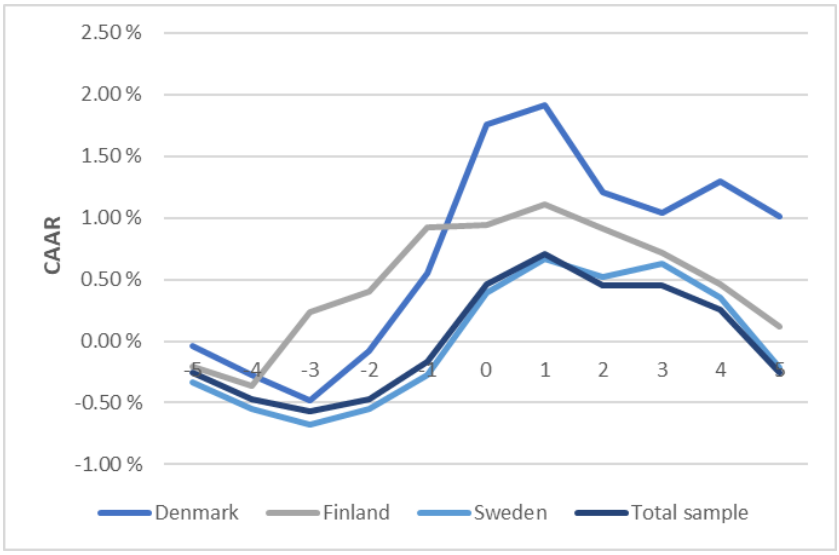

Figure 5 CAARs of the dividend increase announcements

Overall, the dividend increase announcements are followed by a positive stock price reaction and support the informational content of dividends. Therefore, the first research hypothesis of this study (H1) is accepted. The results suggest that dividend increase announcements have some signalling effect in Nordic market and signal to market a positive future prospect of the firms. This is supported by a significant positive stock price reaction on the dividend increase announcements which is a consequence of investor's positive reaction on the news. If we consider the results at country level, we can notice some differences in results. The results of this study show statistically significant and positive abnormal returns on the dividend increase announcements in Denmark and Sweden. Therefore, the first research hypothesis (H1) is accepted in Denmark and Sweden as well. However, in Finland we do not observe statistically significant results at any significance level on the event day even though the market seems to react positively to dividend increase news. Therefore, the first research hypothesis (H1) is rejected in Finland.

Previous research in Nordic market has showed similar results and report substantial differences between Nordic countries. Liljeblom et al. (2015) report the strongest support for dividend signalling in Sweden whereas the results of this study suggest the strongest support in Denmark showing the highest abnormal return on the event day. In the paper Liljeblom et al. (2015) argue that dividends do not have significant announcement effect in Denmark which is inconsistent with the findings of this study. The differences between the results of this study and the study by Liljeblom et al. (2015) might be explained with different research period and data. In this study, daily closing prices were used whereas monthly data were used in the study by Liljeblom et al. (2015). Consistent with the findings of this study Bechmann & Raaballe (2007) show that dividend announcements are followed by a positive stock price reaction in Denmark and argue that dividends have some signalling effect in market.

Figure 6 shows the development of the CAARs of constant dividend announcements. According to dividend signalling hypothesis, market should not react to constant dividend announcements since they should not provide any new or valuable information to market. Figure 6 confirms that CAARs are substantially stable around the constant dividend announcements. The only exception is Finland where we can notice sharp decline in CAAR starting one day prior the event day. The results are also economically substantially significant indicating even 5 % negative CAAR after the event day. If we consider full sample and Sweden, we can notice that CAARs are stable and close to zero level during the entire event window. Similarly in Denmark CAAR is rather stable.

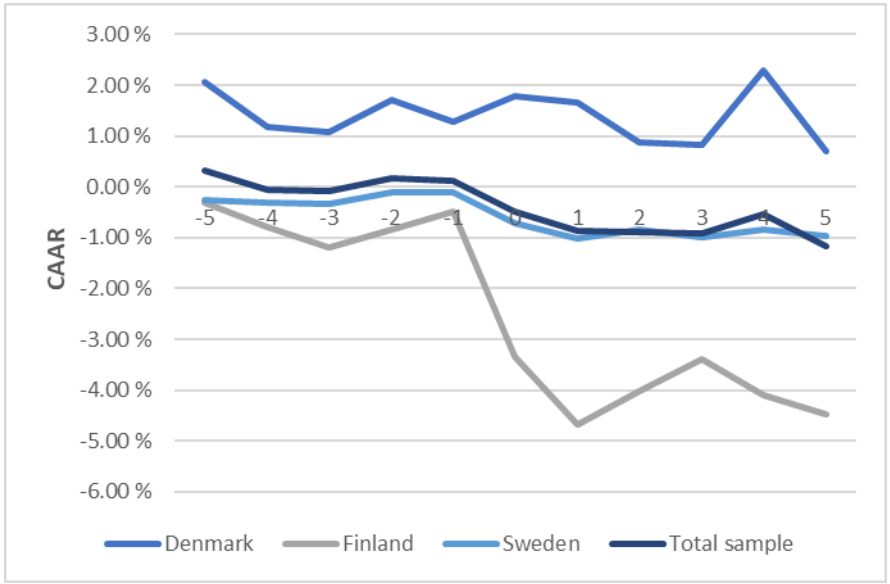

Figure 6 CAARs of the constant dividend announcements

According to the results stock market does not react on constant dividend announcements implying that the market processes the new information in an efficient manner. Therefore, the second research hypothesis of this study (H2) is accepted. If we consider the results at country level, we can notice some differences in results. Results in Denmark and Sweden are consistent with the findings for full sample, and we do not observe any statistically significant results on the event day. Therefore, the second research hypothesis (H2) is accepted in Denmark and Sweden as well. However, in Finland the results of this study show negative and statistically significant returns on constant dividend announcement which differs substantially from the results in Denmark and Sweden. The second research hypothesis (H2) of this study is rejected in Finland.

In figure 7 we can see the development of CAARs of dividend decrease announcements. From the figure we can notice negative and downward sloping CAARs for full sample and Sweden. In Finland one day prior the event day we can notice sharp decline in CAAR as well. Notable is that in Denmark stock market seems to react positively on dividend decrease announcements and we can notice sharp increase in CAAR on the event day. The results are consistent with the findings by Chen et al. (2009) who report positive stock price reaction on dividend decrease announcements as well. Although this differs from the results of Finland and Sweden since Denmark is only to show positive change in CAARs after the event day.

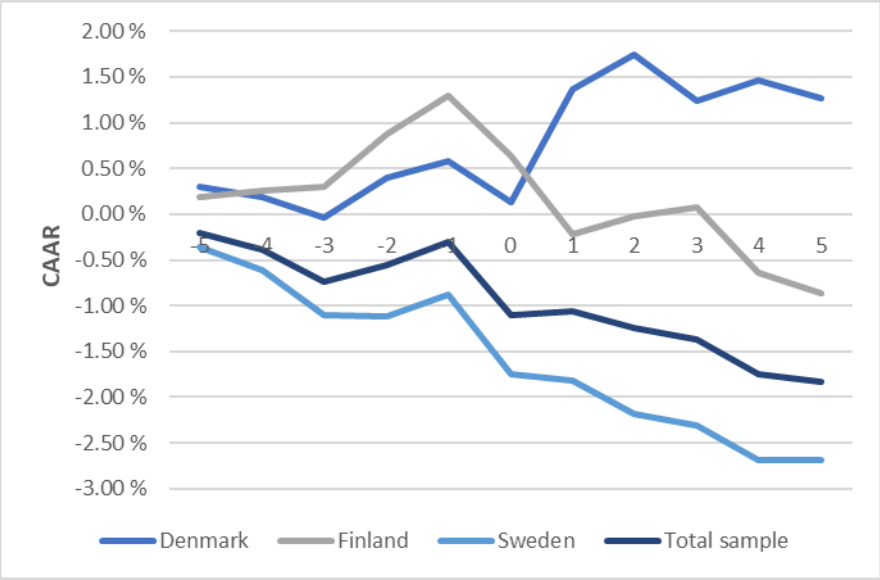

Figure 7 CAARs of the dividend decrease announcements

According to the results stock market seem to react negatively and statistically significantly on dividend decrease announcements. The results show negative and statistically significant abnormal returns on the announcement day which is consistent with the theory. According to dividend signalling hypothesis market should react on dividend decrease announcements negatively since market should see the news of decreasing dividend as a negative news of the firm. The results support the dividend signalling hypothesis indicating that dividends have signalling effect in market. The third research hypothesis (H3) of this study is therefore accepted. If we consider the results at country level, we can notice some differences between Nordic countries. The results in Sweden are consistent with the findings for total sample implying that investors in Sweden see the decreasing dividend as negative news of the firm. Therefore, the third research hypothesis (H3) is accepted in Sweden as well. However, in Denmark and Finland we do not observe statistically significant results on the event day. The third research hypothesis (H3) is rejected in Denmark and Finland. Even though the abnormal returns do not differ statistically significant from zero, the abnormal returns are negative for both countries, Denmark, and Finland, on the event day which is consistent with the theory.

5.1.2 Comparison between different dividend announcement effects

The Welch's test was used to test statistical differences of the CAARs between different dividend announcements. Table 6 shows the corresponding results for each group. First the increase effect was tested against the decrease effect, afterwards increase effect was tested against the constant effect. Finally, the decrease effect was tested against the constant effect. The same procedure was repeated for each sample group during the previously introduced seven periods.

Table 6 Welch's test results for cumulative average abnormal returns (CAAR) of the dividend announcements. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample		*Denmark*		*Finland*		*Sweden*	
[t1,t2]	*Welch t-stat*		*Welch t-stat*		*Welch t-stat*		*Welch t-stat*	
				Increase effect compared to decrease effect				
[-5,-1]	0.36		-1.00		-0.48		1.15	
[-3,-1]	0.74		-0.52		0.42		1.36	
[-1,+1]	2.78	***	0.72		1.40		2.46	**
[0,0]	3.10	***	1.49		0.76		2.63	***
[0,+1]	2.99	***	0.52		1.43		2.70	***
[0,+3]	2.79	***	-0.16		0.71		3.00	***
[0,+5]	2.19	**	-0.18		0.80		2.28	**
				Increase effect compared to constant effect				
[-5,-1]	-0.41		-0.69		1.39		-0.36	
[-3,-1]	0.52		-0.14		1.37		0.21	
[-1,+1]	3.72	***	1.67	*	2.80	***	2.76	***
[0,0]	2.24	**	0.70		2.10	**	1.74	*
[0,+1]	3.00	***	0.93		2.70	**	2.27	**
[0,+3]	2.24	**	0.55		1.71	*	1.94	*
[0,+5]	1.21		0.37		1.78	*	1.00	
				Decrease effect compared to constant effect				
[-5,-1]	-0.57		-0.29		1.63		-1.21	
[-3,-1]	-0.22		0.38		0.94		-0.98	
[-1,+1]	0.70		0.76		1.47		0.20	
[0,0]	-0.33		-0.77		1.45		-0.31	
[0,+1]	0.29		0.34		1.44		-0.03	
[0,+3]	-0.03		0.60		0.88		-0.52	
[0,+5]	-0.23		0.44		0.21		-0.87	

According to the results there are statistical differences between the announcement effects. If we first look at the increase effect compared to decrease effect, we can notice that overall, in Nordic region shareholders see dividend increase announcements and dividend decrease announcements as two separate news and react to them differently. The full-sample results show that on the event day AARs between dividend increases and dividend decreases differ statistically significantly from zero even at the 1 % level. Similar results can be noticed for periods [-1, +1], [0, +1] and [0, +3]. If we consider the results at country level, we can notice similar results in Sweden but for Denmark and Finland, no statistically significant differences between the dividend increases against the decreases are observed. Table 6 shows that the sample means differ statistically significantly from zero between the dividend increase announcements and constant dividend announcements. Similar results can be seen

also in Finland and Sweden but in Denmark the results suggest statistically significant results only for the period [-1, +1], which is statistically significant only at the 10 % level. According to the results decrease effect does not differ statistically significantly from zero from the constant effect in any sample group. This implies that the shareholders price equally these two effects.

The findings of this study support the previous research that argues that dividends have signaling effect in market. Therefore, it can be concluded that the findings of this study do not support the dividend irrelevance hypothesis presented by Miller & Modigliani (1961). Even though the results do not differ statistically significantly from zero for all sample groups, positive abnormal returns for all groups are found for dividend increases and negative for dividend decrease announcements. This indicates that investors recognize the dividend increase announcements as positive news of the firm and dividend decrease announcements as negative news reducing the information asymmetry between shareholders and the firm. The results also show statistical differences between dividend increase effect and dividend decrease effect therefore indicating that the shareholders recognize these two events as a separate news from the firm. The findings also indicate that Nordic market is inefficient in semi-strong form of market efficiency as statistically significant results are reported after the event day for dividend increases and dividend decreases indicating that the market processes the new information slowly. The findings of this study are consistent with the findings by Kumar et al. (2020) who show similar results. Overall previous research in Nordic market has showed differences in results between Nordic countries. The results of this study found substantial differences between countries as well. The findings of this thesis show substantial differences for all dividend announcements between Nordic countries which is consistent with the findings of Liljeblom et al. (2015). The differences between Nordic countries might be a result of different tax treatment of the investors. Overall, Nordic investors should be indifferent between dividends and capital gains since in Denmark and Sweden the taxation is similar for both types of income. In Finland, a certain part of the income is tax-exempt which according to clientele hypothesis should lead to investor preference for dividend income at some level.

As discussed previously, the most statements on dividends announced by the firm's board of directors also include announcements for other significant news of the firm, of which the most important one is information about the earnings (Gurgul et al. 2003). In this thesis the

effect of earnings announcements is not excluded and while analysing the results we should take this into account. Therefore, the overall stock price reaction on dividend announcements might in fact be lower or even higher. However, as mentioned previously dividends are paid from the firm's earnings and earnings are the profits of the firm's performance. Ceteris paribus, if the earnings of the firm increase, the firm is expected to increase the dividend sum accordingly. The agency costs imply the shareholder preference for dividends over the profit, and the likelihood of the firms with a notable dividend payment to improve their value by decreasing the amount of funds available to managers (La Porta et al. 2000). The findings of this thesis support the agency cost theory showing positive and statistically significant stock price reactions on dividend increase announcements. Shareholders seem to prefer dividends, especially increasing dividend. Overall, the findings suggest that announced upcoming dividends have a significant effect on the behaviour of the shareholders, but the magnitude differs between dividend announcement types and countries.

5.2 Trading effects upon the dividend announcements

Table 7 shows the daily average abnormal trading volumes for each individual day during the event window. The results differ statistically significant from zero for all sample groups in case of dividend increases. In addition, the AAVs are positive indicating positive change in trading volume on the dividend increase announcement day. Notable is that AAVs seem to turn negative on post-event period already one day after the event day. This is consistent with the findings by Gurgul et al. (2003) who report negative abnormal trading volume one day after the dividend increase announcement day. Statistically significant and negative AAVs during the post-event period imply that the stock prices drop shortly after the dividend announcement. From the table we can also see that AAVs increase substantially close to event day reaching the peak on the event day. We can observe 90.30 % AAV for total sample on the event day whereas one day prior the event day AAV is only 15.25 %. Similar results can be noticed for all sample groups indicating that dividend increase announcements have effect on trading volume. The results are also similar for dividend decreases and constant dividend announcements. We can observe positive and statistically significant AAVs on the event day for all sample groups. Similarly like for dividend increases, AAVs seem to turn negative already one day after the event day. The highest AAV can be seen in Sweden, where the AAV is 117.93 % on the event day for constant dividend announcement. Notable is that

the AAVs are even higher for constant dividend announcements compared to other announcement types on the event day for all sample groups, except in Denmark. The results in Denmark slightly differ from the results in Finland and Sweden suggesting lower AAV on the event for constant dividend announcements compared to dividend increases. Together any form of dividend change announcements reflects to market new and valuable information being followed by a positive change in trading volumes.

Table 7 Daily average abnormal trading volumes (AAV) of the dividend announcements. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample			*Denmark*			*Finland*			*Sweden*		
DAYS	***AAV %***		***t-statistics***	***AAV %***		***t-statistics***	***AAV %***		***t-statistics***	***AAV %***		***t-statistics***
						Dividend Increases						
-5	1.38 %		0.43	2.87 %		0.36	-2.12 %		-0.26	1.80 %		0.46
-4	1.33 %		0.41	4.46 %		0.61	10.47 %		1.23	-1.34 %		-0.34
-3	-0.07 %		-0.02	1.04 %		0.12	-8.18 %		-0.85	1.42 %		0.38
-2	6.84 %	**	2.22	8.32 %		1.36	19.04 %	**	2.22	3.89 %		1.03
-1	15.25 %	***	5.38	8.92 %		1.11	22.89 %	***	2.98	15.05 %	***	4.60
0	90.30 %	***	27.30	74.43 %	***	10.36	70.89 %	***	10.54	98.07 %	***	23.41
1	-29.93 %	***	-9.30	-28.25 %	***	-3.62	-34.33 %	***	-4.88	-29.37 %	***	-7.31
2	-30.42 %	***	-9.58	-38.45 %	***	-5.65	-29.23 %	***	-3.87	-28.85 %	***	-7.22
3	-19.45 %	***	-6.37	-15.12 %	*	-1.93	-19.45 %	**	-2.49	-20.43 %	***	-5.56
4	-6.66 %	**	-2.31	4.48 %		0.61	-11.14 %		-1.62	-8.23 %	**	-2.34
5	-6.24 %	**	-2.21	2.70 %		0.46	-6.65 %		-0.79	-8.18 %	**	-2.41
						Constant Dividends						
-5	-3.82 %		-0.55	-2.16 %		-0.12	3.55 %		0.27	-6.18 %		-0.81
-4	0.09 %		0.02	-3.44 %		-0.26	-14.45 %	*	-1.86	4.87 %		0.63
-3	-2.04 %		-0.31	-8.34 %		-0.49	10.14 %		0.98	-1.82 %		-0.24
-2	8.31 %		1.17	13.56 %		0.69	10.82 %		1.42	5.37 %		0.69
-1	18.23 %	***	3.15	16.87 %		1.24	22.30 %	**	2.09	17.96 %	**	2.50
0	99.54 %	***	14.08	66.72 %	***	4.78	83.79 %	***	6.59	117.93 %	***	12.81
1	-46.02 %	***	-7.63	-46.95 %	***	-3.34	-21.32 %	*	-1.81	-50.97 %	***	-6.92
2	-22.61 %	***	-3.80	-4.84 %		-0.37	-25.04 %	*	-2.03	-30.17 %	***	-4.03
3	-19.28 %	***	-3.69	-23.98 %	**	-2.45	-30.37 %	***	-3.45	-14.72 %	**	-2.02
4	-9.46 %		-1.35	-13.18 %		-0.75	-9.33 %		-0.78	-7.80 %		-0.94
5	-3.87 %		-0.59	3.57 %		0.29	-12.61 %		-0.88	-5.36 %		-0.60
						Dividend Decreases						
-5	1.05 %		0.19	2.30 %		0.12	-3.94 %		-0.31	2.01 %		0.33
-4	-6.84 %		-1.43	-5.29 %		-0.39	-14.25 %		-1.04	-5.34 %		-0.99
-3	7.45 %		1.50	13.15 %		1.03	2.91 %		0.24	7.24 %		1.19
-2	-2.85 %		-0.60	-6.71 %		-0.50	1.41 %		0.18	-3.00 %		-0.50
-1	17.41 %	***	3.85	9.55 %		0.63	20.97 %	**	2.04	18.38 %	***	3.60
0	97.66 %	***	18.63	79.67 %	***	5.09	97.58 %	***	8.07	101.96 %	***	16.59
1	-35.79 %	***	-7.21	-11.72 %		-0.73	-50.35 %	***	-4.49	-37.85 %	***	-6.73
2	-26.57 %	***	-6.72	-28.02 %	**	-2.59	-19.09 %		-1.63	-28.10 %	***	-6.35
3	-18.40 %	***	-4.15	-27.92 %	**	-2.63	-29.35 %	***	-3.21	-13.38 %	**	-2.37
4	-7.55 %		-1.51	-3.34 %		-0.19	-0.70 %		-0.08	-10.27 %	*	-1.80
5	-8.19 %		-1.52	6.75 %		0.41	3.05 %		0.38	-14.58 %	**	-2.16

Table 8 shows the cumulative average abnormal trading volumes of different dividend change announcements. Similarly like for stock prices seven different periods were used to investigate the trading volume changes around the dividend change announcements. From the table 8 we can notice that the effect of dividend announcements on trading volumes is even more intense when we examine the CAAVs. The findings indicate that dividend increase announcements have a positive and statistically significant effect on trading volumes even at 1 % level for all sample groups during the pre-event period. This implies that investors seem to react to news in advance at some level. We can also notice statistically significant CAAVs on post-event period, but the positive and statistically significant effect starts to decline after [0, +3] period. Only exception is Finland where we can notice CAAV -29.91 % even on [0, +5] post-event period indicating statistically significant negative change in trading volume. Overall, the results indicate that the highest CAAV can be observed on the event day, and close to event day on periods [-1, +1] and [0, +1].

Constant dividend announcements seem to have a positive and statistically significant effect on CAAVs upon the announcements in all sample groups. Unlike in Finland and Sweden, the results in Denmark are statistically significant only on the event day and on [-1, +1] period which differs statistically significant from zero only at the 10 % level. Similarly, to dividend increases, and constant dividend announcements investors seem to react to dividend decrease announcements also in advance by increasing the trading volume prior the announcement. In Denmark and Finland, the findings indicate that CAAVs differ statistically significant from zero only on the event day and in periods [-1, +1] and [0, +1]. This slightly differs from the results in Sweden where we can clearly observe statistically significant results for all periods except for [0, +5] post-event period. Overall, the abnormal trading volume on the event day seem to be even higher for dividend decreases compared to dividend increases. This is consistent with the findings by Gurgul et al. (2003).

Table 8 Cumulative average abnormal trading volumes (CAAV) of the dividend announcements. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Fulll sample			*Denmark*			*Finland*			*Sweden*		
[t1,t2]	***CAAV %***		***t-statistics***	***CAAV %***		***t-statistics***	***CAAV %***		***t-statistics***	***CAAV %***		***t-statistics***
						Dividend Increases						
[-5,-1]	24.74 %	***	6.90	25.60 %	***	2.95	42.11 %	***	4.28	20.81 %	***	4.87
[-3,-1]	22.02 %	***	6.60	18.27 %	**	2.10	33.75 %	***	3.91	20.36 %	***	5.12
[-1,+1]	75.62 %	***	18.94	55.10 %	***	5.46	59.45 %	***	6.32	83.75 %	***	17.33
[0,0]	90.30 %	***	27.30	74.43 %	***	10.36	70.89 %	***	10.54	98.07 %	***	23.41
[0,+1]	60.37 %	***	16.27	46.18 %	***	5.22	36.56 %	***	4.48	68.70 %	***	14.99
[0,+3]	10.50 %	***	2.98	-7.39 %		-0.90	-12.12 %		-1.24	19.42 %	***	4.65
[0,+5]	-2.40 %		-0.67	-0.21 %		-0.02	-29.91 %	***	-3.17	3.00 %		0.70
						Constant Dividends						
[-5,-1]	20.78 %	***	2.82	16.49 %		0.91	32.37 %	***	3.34	20.20 %	**	2.23
[-3,-1]	24.50 %	***	3.21	22.09 %		1.06	43.27 %	**	2.79	21.51 %	***	2.69
[-1,+1]	71.76 %	***	9.38	36.64 %	*	1.89	84.77 %	***	5.53	84.91 %	***	10.12
[0,0]	99.54 %	***	14.08	66.72 %	***	4.78	83.79 %	***	6.59	117.93 %	***	12.81
[0,+1]	53.53 %	***	7.33	19.77 %		1.23	62.47 %	***	3.87	66.95 %	***	7.56
[0,+3]	11.64 %	*	1.66	-9.05 %		-0.58	7.05 %		0.51	22.07 %	**	2.53
[0,+5]	-1.70 %		-0.20	-18.66 %		-0.95	-14.89 %		-0.89	8.91 %		0.85
						Dividend Decreases						
[-5,-1]	16.22 %	***	2.82	13.01 %		0.68	7.10 %		0.43	19.29 %	***	3.23
[-3,-1]	22.01 %	***	4.70	16.00 %		1.02	25.29 %	*	1.96	22.62 %	***	4.56
[-1,+1]	79.28 %	***	14.70	77.50 %	***	4.97	68.21 %	***	7.31	82.49 %	***	12.23
[0,0]	97.66 %	***	18.63	79.67 %	***	5.09	97.58 %	***	8.07	101.96 %	***	16.59
[0,+1]	61.87 %	***	12.51	67.95 %	***	3.87	47.23 %	***	6.12	64.11 %	***	11.15
[0,+3]	16.90 %	***	3.42	12.01 %		0.78	-1.20 %		-0.14	22.62 %	***	3.78
[0,+5]	1.16 %		0.18	15.42 %		0.95	1.15 %		0.10	-2.23 %		-0.27

Overall, the results of this study suggest that dividend announcements have a positive effect on abnormal trading volumes in all sample groups. This is consistent with the findings by Gurgul et al. (2003) who report positive change in trading volumes for constant dividend announcements and for both dividend increase, as well dividend decrease announcements. Consistent with their findings we argue that any form of dividend announcement reflects to market a new and valuable information. Since investors differ from the precision of their private prior information and are diversely informed, they respond to a new information differently. This is reflected to trading volumes as a positive change. (Gurgul et al. 2003)

Similar results have also been reported by Karpoff (1986) and Kim & Verrecchia (1991). Although most of the previous research has shown that trading volumes change to same direction as an announced dividend change. Dasilas & Leventis (2011) argue that trading volume of the stocks move in the same direction as stock prices. The findings of this thesis are not consistent with their results since positive change in trading volume is observed for all dividend announcements. Similar results are reported for all Nordic countries under investigation therefore differing from the results for stock price reaction where substantial differences were found between Nordic countries. The results for trading volume change differ in the magnitude, but the changed direction is consistent for all sample groups.

Figure 8 shows the development of CAAVs for the full sample. The CAAVs are very similar for all dividend announcements. Abnormal trading volume starts to grow significantly one day prior the event day reaching the peak on the event day. The pattern also shows that trading volume starts to decrease immediately after the event day indicating that the new information is processed rather efficiently. This also indicates that investors seem to revise their portfolios based on dividend information rather quickly after the announcements. Overall, the results of this study suggest also economically significant results in trading volume around the dividend announcements.

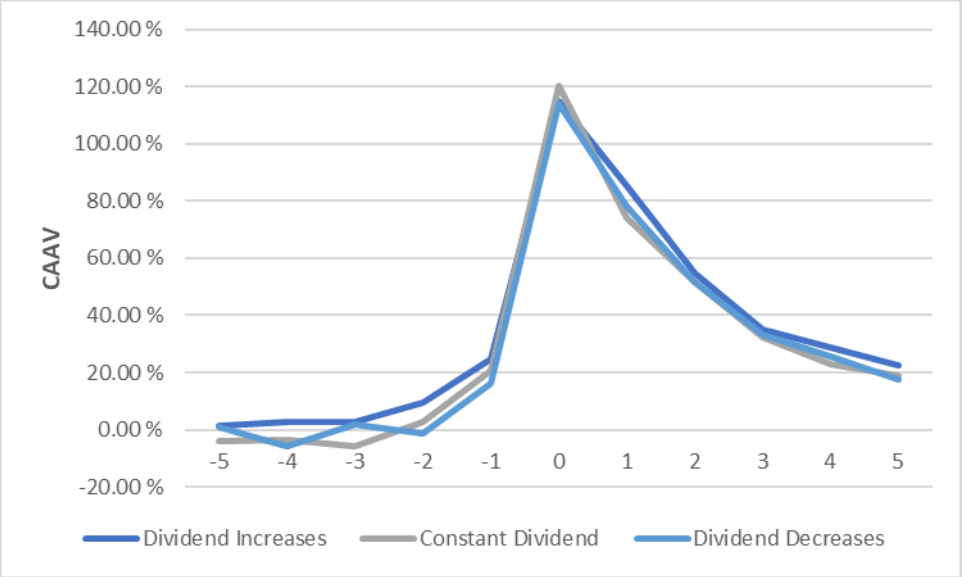

Figure 8 Development of CAAVs for full sample

According to dividend signalling hypothesis trading volume should increase when the firm announces an increasing dividend since investors are willing to take an advantage to benefit of the stock ownership and recognises the new information as a positive news of the firm. The findings of this study are consistent with this, as positive and statistically significant abnormal trading volume is observed on the dividend increase announcement day. The fourth research hypothesis of this study (H4) is therefore accepted. The results at country level show statistically significant and positive abnormal trading volumes for all Nordic countries. Therefore, the fourth research hypothesis is accepted in Denmark, Finland, and Sweden separately as well. Constant dividend announcement should not provide any new or valuable information to market leaving the trading volume unaltered. However, the findings of this study show statistically significant abnormal trading volumes on the constant dividend announcement day. Therefore, the fifth research hypothesis (H5) is rejected. If we consider the results at country level, we can observe positive and statistically significant results in all sample groups on the event day. The fifth research hypothesis (H5) is therefore rejected in Denmark, Finland, and Sweden as well. According to theory trading volume is expected to decrease when the firm announces a decreasing dividend since market prices these announcements opposite to dividend increases thus seeing dividend decreases as bad news of the firm (Dasilas & Leventis 2011). However, the results of this study indicate that dividend decrease announcement has a positive and statistically significant effect on trading volume on the event day. Therefore, the sixth research hypothesis of this study (H6) is rejected. The results at country level suggest positive and statistically significant abnormal trading volume in all the examined countries. The sixth research hypothesis (H6) is therefore rejected in all Nordic countries separately.

5.2.1 Comparison between different dividend announcement effects

Similarly like for abnormal returns, the Welch's test was used to test statistical differences of the CAAVs between different dividend change announcements. Table 9 shows the corresponding results for each group. First the increase effect was tested against the decrease effect, then the increase effect was tested against the constant effect. Finally, the decrease effect was tested against the constant effect. The same procedure was repeated for each sample group during the seven different periods.

Table 9 indicates that the increase effect does not differ statistically significantly from decrease effect in any sample group except in Finland. In Finland the results suggest that the sample mean between the dividend increases and dividend decreases differs statistically significantly but only at the 10 % level. The results between the increase effect and constant effect suggest statistically significant results on the event day only in Sweden but only at the 10 % level. The results do not find major differences between the decrease effect and constant effect either. This implies that any form of the dividend announcements reflects to market as increased trading volume and therefore trading of the shareholders do not differ between the announcements.

Table 9 Welch's test results for cumulative average abnormal trading volumes (CAAV) of the dividend announcements. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample	*Denmark*	*Finland*	*Sweden*
[t1,t2]	***Welch t-stat***	***Welch t-stat***	***Welch t-stat***	***Welch t-stat***
Increase effect compared to decrease effect				
[-5,-1]	1.24	0.59	1.78 *	0.21
[-3,-1]	0.00	0.13	0.54	-0.35
[-1,+1]	-0.54	-1.19	-0.65	0.15
[0,0]	-1.18	-0.30	-1.90 *	-0.52
[0,+1]	-0.24	-1.09	-0.94	0.62
[0,+3]	-1.04	-1.10	-0.83	-0.43
[0,+5]	-0.48	-0.84	-2.10 **	0.56
Increase effect compared to constant effect				
[-5,-1]	0.48	0.45	0.69	0.06
[-3,-1]	-0.29	-0.17	-0.53	-0.13
[-1,+1]	0.44	0.85	-1.38	-0.12
[0,0]	-1.17	0.49	-0.88	-1.94 *
[0,+1]	0.83	1.44	-1.41	0.17
[0,+3]	-0.14	0.09	-1.12	-0.27
[0,+5]	-0.08	0.86	-0.76	-0.52
Decrease effect compared to constant effect				
[-5,-1]	-0.48	-0.13	-1.29	-0.08
[-3,-1]	-0.28	-0.23	-0.87	0.12
[-1,+1]	0.80	1.63	-0.90	-0.22
[0,0]	-0.21	0.61	0.77	-1.43
[0,+1]	0.94	2.01 **	-0.84	-0.27
[0,+3]	0.61	0.95	-0.50	0.05
[0,+5]	0.27	1.33	0.78	-0.83

The findings of this study suggest that any form of dividend announcements reflect to market as increased trading volume. This implies that shareholders are increasing their interest towards the firm despite the announced direction of the dividend. This can be explained with clientele effect since an announced new event from the firm might draw investors' attention to dividend paying stocks. As discussed previously, the observed stock price reactions reflect the average change in the beliefs of the shareholders such that heterogeneity is lost in aggregate at the individual level (Gurgul et al. 2003). This can be noticed in results since insignificant abnormal returns are reported for constant dividend announcements, but we can still observe substantial increase in trading volume. Only exception is Finland where we can observe a negative and statistically significant abnormal returns on constant dividend announcements and an increase in trading volume. For dividend increases the results show positive abnormal returns and an increase in trading volume for all sample groups whereas for dividend decreases the abnormal returns are negative on the event day but the trading volume moves to an opposite direction suggesting increasing trading volume. Changes in stock prices examine the average reaction on events, whereas trading volume reflects the sum of differences in reactions of traders (Gurgul et al. 2003). This implies that the trading volume of the investors reacts to all dividend announcements regardless of the reactions on stock prices caused by the same event. According to clientele effect investors are sorted to different groups according to their beliefs and behaviour (Miller & Modigliani 1961). Investors who expect growing dividend react positively on the increasing dividend announcement news. Similarly, investors might see the decreasing dividend as an opportunity of the firm to invest the profits of the firm prosperously instead for sharing it to shareholders. Thus, the investors give buying pressure for the stock. Investors who do not expect dividend and prefer stable dividend see a constant dividend as good news from the firm since the firm is investing part of its profit to business opportunities instead of sharing the extra profit to investors. Therefore, the trading volume reflects the sum of differences in reactions of traders (Gurgul et al. 2003) and the changes in trading volumes are a consequence of different clientele.

Similarly, to stock price reaction the overall trading volume change around the dividend announcements might in fact be lower or even higher since the event effect might include joint effect of dividend and earnings announcements instead of pure reaction on dividend announcements. It could be concluded that the stock market seems to react on dividend announcements, but one cannot be certain is the reaction a consequence only of a dividend

announcement or a joint effect of two different announcements. Since the results of this thesis show that stock market seems to react to all dividend announcements positively and statistically significant investors might also just revise their portfolios based on the stock price changes rather than reaction to new information. However, this cannot be generalized in other markets. The benchmark indices used in the study includes also proportionally more large-cap firms compared to mid-cap firms, also leaving out the small and micro-cap firms from the overall market benchmark. The results of this study suggest that the stock's abnormal trading differs significantly from the trading volume of the benchmark index regardless of the announcement type. This can be partially explained with information-related trading activity (Tkac 1999).

5.3 The results based on the market capitalization

Table 10 shows the results for CAARs of the dividend announcements. The sample was divided based on the market capitalization into two different sample groups, mid-cap firms included in the OMX Nordic Mid Cap Index and for large-cap firms included in OMX Nordic Large Cap Index. Due to small sample sizes in Denmark and Finland the market cap-based analysis is provided only at Nordic region level. This enables to provide more valid results since smaller sample sizes might cause lower possibilities to observe event effects. For the market cap comparison only three different periods were used to test the statistical significances of the CAARs.

Table 10 The results for cumulative average abnormal returns (CAAR) of the dividend announcements based on the market cap of the firm. The corresponding Welch's t-statistics represents the difference between mid-cap and large-cap firms. Significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample		*Large cap*		*Mid cap*		*Difference*
[t1,t2]	***CAAR %***	***t-statistics***	***CAAR %***	***t-statistics***	***CAAR %***	***t-statistics***	***Welch t-stat***
			Dividend Increases				
[-1,+1]	1.18 % ***	4.16	0.91 % **	2.55	1.61 % ***	3.34	-1.18
[0,0]	0.63 % ***	2.80	0.59 % **	2.00	0.69 % *	1.94	-0.22
[0,+1]	0.87 % ***	3.34	0.85 % **	2.48	0.90 % **	2.21	-0.11
			Constant Dividends				
[-1,+1]	-1.02 % **	-1.99	-1.18 % *	-1.70	-0.86 %	-1.11	-0.30
[0,0]	-0.59 %	-1.20	-1.08 %	-1.65	-0.08 %	-0.11	-1.02
[0,+1]	-0.97 % *	-1.76	-1.39 % *	-1.98	-0.54 %	-0.63	-0.77
			Dividend Decreases				
[-1,+1]	-0.50 %	-0.95	0.33 %	0.49	-1.50 % *	-1.81	1.70 *
[0,0]	-0.80 % **	-2.01	0.02 %	0.03	-1.77 % ***	-3.09	2.25 **
[0,+1]	-0.75 %	-1.60	-0.08 %	-0.12	-1.56 % **	-2.23	1.56

As we can see, mid-cap firms have the highest AAR on the event day for dividend increase announcements. The results suggest 0.69 % AAR on the event day which is 0.10 % higher compared to large-cap firms. Table 10 reveals that the CAARs are higher in all periods for mid-cap firms. Based on the Welch t-statistics, all CAAR differences between mid-cap and large-cap firms in case of dividend increases are insignificant even though the CAARs are higher for mid-cap firms. Figure 9 illustrates the development of the CAARs of the dividend increase announcements based on the market cap. For mid-cap firms the CAARs are higher compared to large cap firms and full sample. The results are not economically significant suggesting only approximately 1.25 % CAAR on the event day whereas corresponding return for large-cap firms is approximately only 0.10 %.

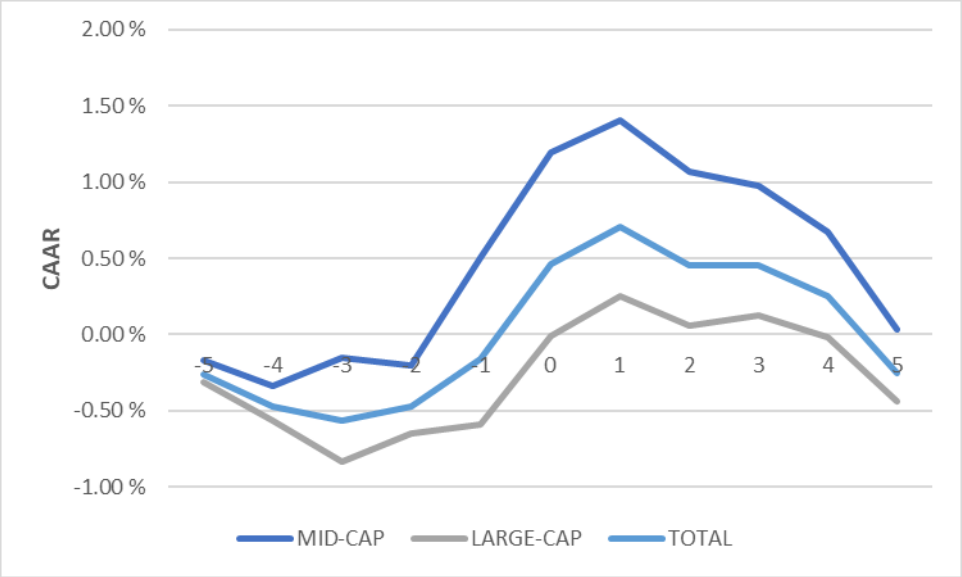

Figure 9 CAARs of dividend increase announcements based on the market cap

Figure 10 shows the development of the CAARs of the dividend decrease announcements based on the market cap. Similarly, to dividend increases stock market seems to react even more intense to dividend decrease announcements of the mid-cap firms than for large-cap firms. The results suggest approximately -2.25 % CAAR within [-5, 0] time span for mid-cap firms whereas the corresponding result for large-cap firms is approximately -0.20 %. Table 10 shows also that the AAR on the event day for mid-cap firms is -1.77 % which is significantly higher compared to large-cap firms. Interesting finding is also that the results suggest positive AAR of 0.02 % for large-cap firms on the event day. The corresponding Welch's t-statistics suggest also statistically significant difference between the dividend decrease announcements. This implies that the shareholders see the dividend decrease announcements from mid-cap firms differently compared to large-cap firms. Smaller firms seem to have more pronounced stock price reactions compared to larger firms. This can be explained with clientele effect since an announced new event from the smaller unknown firm might draw investors' attention more compared to larger firms which are already well-known among investors. Larger firms are also required to share more information to investors due to higher regulation compared to smaller firms. Therefore, investors might at least some level expect the dividend from the larger firms and price the news already partially in advance since larger firms are required to share more information to shareholders during the year and therefore increasing the transparency and decreasing the asymmetric information between the firm and shareholders.

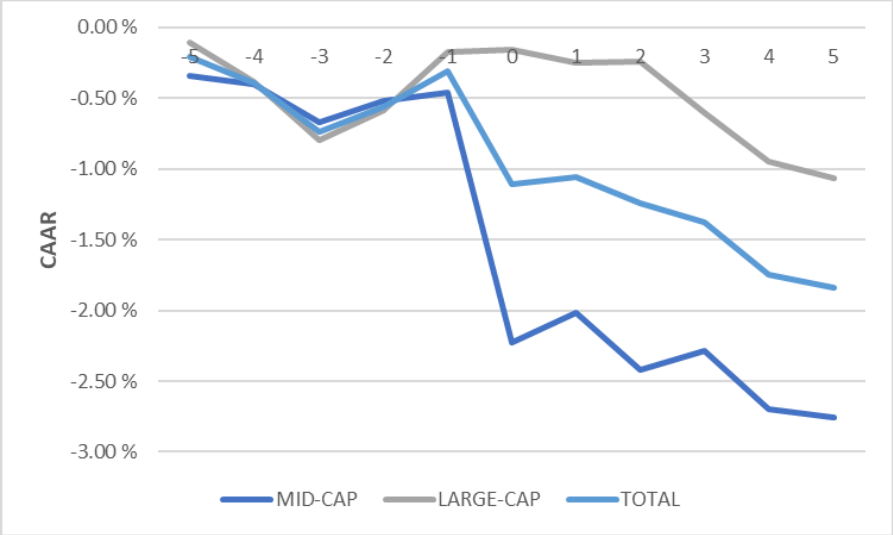

Figure 10 CAARs of the dividend decrease announcements based on the market cap

Table 11 indicates the results of Welch's test for CAARs of the dividend announcements. First the increase effect was tested against the decrease effect, followed by increase effect being tested against the constant effect. Finally, the decrease effect was tested against the constant effect. The same procedure was repeated for each sample group during three different time spans. For the comparison proposed results of the full sample are also included in the table.

Table 11 Welch's test results for cumulative average abnormal returns (CAAR) of the dividend announcements based on the market cap of the firm. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample		*Large cap*		*Mid cap*	
[t1,t2]	***Welch t-stat***		***Welch t-stat***		***Welch t-stat***	
			Increase effect compared to decrease effect			
[-1,+1]	2.78	***	0.74		3.24	***
[0,0]	3.10	***	0.91		3.65	***
[0,+1]	2.99	***	1.27		3.04	***
			Increase effect compared to constant effect			
[-1,+1]	3.72	***	2.68	***	2.71	***
[0,0]	2.24	**	2.32	**	0.95	
[0,+1]	3.00	***	2.86	***	1.52	
			Decrease effect compared to constant effect			
[-1,+1]	0.70		1.55		-0.56	
[0,0]	-0.33		1.29		-1.81	*
[0,+1]	0.29		1.38		-0.92	

The results show statistical differences between the announcement effects. The investors of mid-cap firms recognise the dividend increase and dividend decrease announcements as a two separate news and prices them differently. Table 11 show that the sample means differ statistically significantly in all time spans when testing the increase effect against the decrease effect for mid-cap firms. Conversely, for large-cap firms increase effect do not differ statistically significantly from decrease effect implying that the investors of the large-cap firms do not price this two news as differently compared to mid-cap firms. Shareholders might not recognize the decreasing dividend as a negative news since larger firms have higher transparency compared to smaller firms. Shareholders might also see a decreasing dividend more pronounced for smaller firms since the dividend is seen as a signal of the future performance of the firm. Smaller firms are expected to have higher growth potential pressure compared to larger firms and decreasing dividend signals to market lower future performance of the firm whereas increasing dividend signalling the opposite. If we compare the increase effect against the constant effect, we can notice that the sample mean differs statistically significantly from zero for large-cap firms whereas for mid-cap firms the results suggest statistically significant difference only in period [-1, +1]. This might be a consequence that the stock market reacts substantially negatively on constant dividend announcements of the large-cap firms, as seen also in Table 10. The results of this study suggest that the decrease effect differs statistically significantly from constant effect for mid-cap firms implying that decreasing dividend is seen as a negative news of the firm and constant dividend is seen as a stable news as also evidenced in table 10. The results in Table 11 suggest that the decrease effect do not differ from constant effect for large-cap firms.

According to findings of this study, there are differences between mid-cap firms and large-cap firms. Overall, the results suggest that the stock price reactions are more pronounced for mid-cap firms compared to large-cap firms. This might be a consequence of lower transparency of the smaller firms and higher expectations against the smaller firms set by shareholders. Previous research has also argued that larger firms have less information asymmetry between the firm and shareholders (Günther 2017). Therefore, dividend change announcements from smaller firms have more pronounced reactions. The seventh research hypothesis (H7) of this study is therefore accepted. Smaller firms are also argued to be more volatile stocks and therefore increasing dividend might signal to market a constant return that helps to minimize the volatility and offset the downward movements. The results of this

thesis are consistent with the previous research that argues that larger firms have less pronounced stock price reactions compared to smaller firms. (Günther 2017)

5.3.1 Trading effects

Similarly, to stock price reactions, the results for CAAVs of the dividend change announcements based on the market cap are shown below in table 12.

Table 12 The results for cumulative average abnormal trading volumes (CAAV) of the dividend announcements based on the market cap of the firm. The corresponding Welch's t-statistics represents the difference between mid-cap and large-cap firms. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample		*Large cap*		*Mid cap*		*Difference*
[t1,t2]	***CAAR %***	***t-statistics***	***CAAR %***	***t-statistics***	***CAAR %***	***t-statistics***	***Welch t-stat***
			Dividend Increases				
[-1,+1]	75.62 % ***	18.94	69.06 % ***	15.99	85.78 % ***	11.07	1.86 *
[0,0]	90.30 % ***	27.30	79.25 % ***	20.82	107.41 % ***	18.01	3.98 ***
[0,+1]	60.37 % ***	16.27	54.71 % ***	14.17	69.13 % ***	9.33	-1.22
			Constant Dividends				
[-1,+1]	71.76 % ***	9.38	65.49 % ***	9.10	78.10 % ***	5.68	0.81
[0,0]	99.54 % ***	14.08	92.66 % ***	9.86	106.51 % ***	9.91	0.97
[0,+1]	53.53 % ***	7.33	47.60 % ***	6.27	59.53 % ***	4.69	0.81
			Dividend Decreases				
[-1,+1]	79.28 % ***	14.70	72.20 % ***	14.91	87.70 % ***	8.41	1.35
[0,0]	97.66 % ***	18.63	84.26 % ***	13.38	113.60 % ***	13.16	2.77 ***
[0,+1]	61.87 % ***	12.51	54.60 % ***	10.54	70.53 % ***	7.83	1.53

The results show higher CAAVs for all dividend announcements in all periods for mid-cap firms compared to large-cap firms. Similar results can be seen also in Figures 11 and 12. Figure 11 illustrates the development of CAAVs during the event window for dividend increase announcements. Overall, the results are economically substantially significant suggesting over 100 % CAAVs for all sample groups on the event day. The CAAVs seem to turn downwards substantially soon after the event day implying that the market processes the new information rather efficiently. Welch's t-statistics in Table 12, indicates that the difference in dividend increase announcements between the mid-cap firms and large-cap firms is statistically significant even at the 1 % level. This implies that the trading volume responses on the dividend increase announcements is more pronounced for mid-cap firms

compared to large-cap firms since the results suggest 107.41 % CAAV for mid-cap firms and 79.25 % CAAV for large-cap firms on the event day.

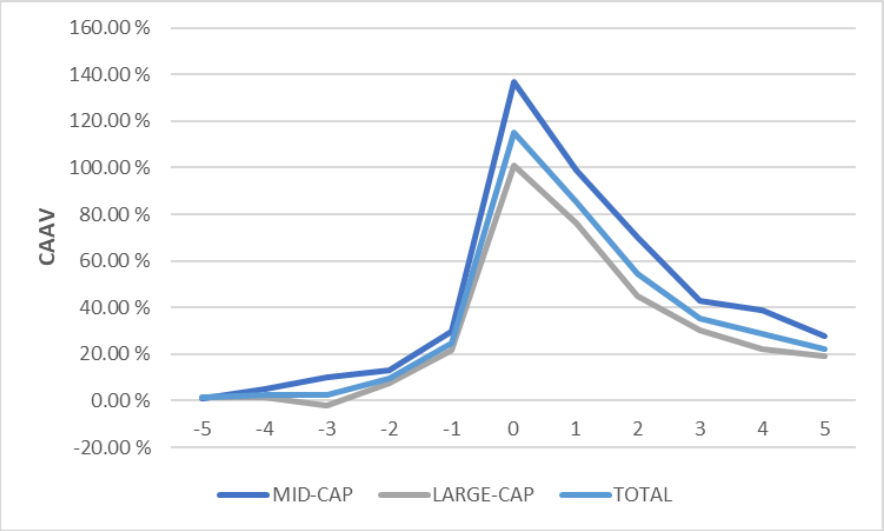

Figure 11 CAAVs of dividend increase announcements based on the market cap

Figure 12 illustrates the development of the CAAVs for dividend decrease announcements. Notable is that the pattern of the CAAVs is substantially similar for both announcement types implying that the market reacts similarly for all dividend announcements and regardless of the market cap of the firm. Welch's t-statistics in Table 12 show that there is statistically significant difference between mid-cap firms and large-cap firms in case of dividend decrease announcements. The results suggest that on the event day the CAAVs differ statistically significantly even at the 1 % level. This implies that mid-cap firms have more pronounced reaction in trading volume for dividend decreases since the results suggest 113.60 % CAAV for mid-cap firms and 84.26 % CAAV for large-cap firms on the event day. For constant dividend announcements the results suggest higher CAAV for mid-cap firms compared to large-cap firms, but unlike for dividend increases and dividend decreases the corresponding Welch's t-statistics do not show statistical differences between mid-cap firms and large-cap firms. Similarly, like for stock prices, the Welch's test was also executed to research the announcement effects. The results can be seen in Appendix 8. The announcement effects do not differ statistically significantly from zero in any sample groups which is consistent with the findings presented in sub-section 5.2.1.

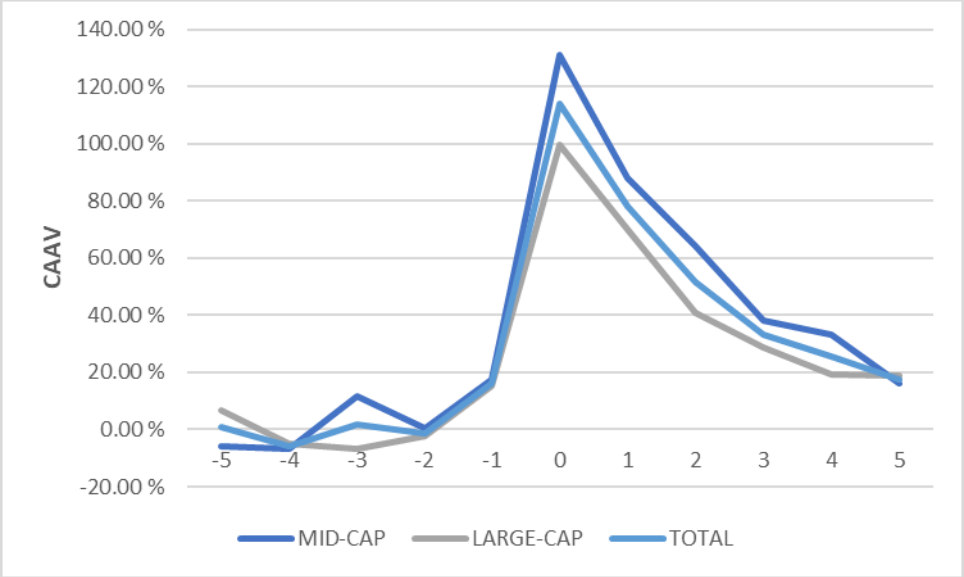

Figure 12 CAAVs of dividend decrease announcements based on the market cap

According to findings of this study, trading volume responses on the dividend change announcements differ between mid-cap firms and large-cap firms. Although the results suggest increase in trading volume for both mid-cap and large-cap firms implying that the stock market reacts positively on all dividend announcements regardless of the market cap of the firm. The stock market reacts more pronounced for mid-cap firm's announcements by increasing the trading volume more significantly compared to large-cap firms. Therefore, the last research hypothesis of this study (H8) is accepted, and it can be concluded that the abnormal trading volume is negatively associated with the market cap of the firm. The results are consistent with the previous research that argues that smaller firms have higher trading volume responses on dividend change announcements (Günther 2017; Ziebart 1990). The results can be explained with clientele effect since an announced new event from the smaller unknown firm might draw investors' attention more compared to larger well-known firms.

6 Conclusions

This study researches the issue of informational content of dividends in three Nordic countries, Denmark, Finland, and Sweden. The objective in this study was to research stock market reaction on different dividend announcements, i.e., dividend increases, constant dividends and dividend decreases for listed firms in Nasdaq Nordic. The stock market reaction was researched with two different approaches, first including the stock price reaction on dividend announcements and the second approach including the trading volume responses on dividend announcements. Event study methodology was used to measure the abnormal returns and abnormal trading volumes during the 11−day event window. The total sample of this study included 977 dividend change announcements by 253 firms during the 2018−2022 sample period. Each announcement type was analysed separately, including 581 dividend increase announcements, 172 constant dividend announcements and 224 dividend decrease announcements. The objective was also find out whether there are any differences across the countries. For this purpose, the sample was divided further into country level groups. Market value-based analysis was executed by comparing differences between mid-cap firms and large-cap firms. The study aims to answer to five research questions presented below:

1. *Do dividend announcements have an abnormal effect on stock returns?*
2. *Are there any differences in abnormal stock returns between different dividend announcements? Are there any differences between exchanges?*
3. *Does trading volume change around the dividend announcement?*
4. *Are there any differences in abnormal trading volumes between different dividend announcements? Are there any differences between exchanges?*
5. *Do the stock market reactions on the dividend announcements differ between firms based on their market values? Are there any differences between mid-cap firms and large-cap firms?*

In this study eight research hypotheses were formed based on the theory and previous research to answer the above presented research questions. Table 13 shows the research hypotheses and the corresponding inferences.

Table 13 Results

HYPOTHESIS	RESULTS						EVIDENCE
	Dividend Increases		*Constant dividends*		*Dividend decreases*		
	Full sample	*Country level*	*Full sample*	*Country level*	*Full sample*	*Country level*	
H1: Dividend increase announcement is followed by a positive stock price reaction	Accepted	Denmark & Sweden Accepted, Finland Rejected	-	-	-	-	Statistically significant AAR is found for all sample groups except for Finland. For all sample groups results suggest positive AAR on the event day implying positive stock market reaction on the news.
H2: Constant dividend announcement does not have an effect on stock price	-	-	Accepted	Finland Rejected, Denmark & Sweden Accepted	-	-	Insignificant AARs are found for all sample groups except for Finland where the results suggest negative and statistically significant -2.86 % AAR on the event day.
H3: Dividend decrease announcement is followed by a negative stock price reaction	-	-	-	-	Accepted	Denmark & Finland Rejected, Sweden accepted	Statistically significant AAR is found for full sample and Sweden on the event day. For all sample groups results suggest negative AAR on the event day implying negative stock market reaction on the news.
H4: Trading volume of the stock increases on the announcement day, if the firm announces increasing dividend	Accepted	Accepted in all countries	-	-	-	-	Results show statistically significant and positive AAVs for all sample groups on the event day: Full sample 90.30 %, Denmark 74.43 %, Finland 70.89 %, and Sweden 98.07 %.
H5: Constant dividend announcement does not have effect on trading volume of the stock	-	-	Rejected	Rejected in all countries	-	-	Results show statistically significant and positive AAVs for all sample groups on the event day: Full sample 99.54 %, Denmark 66.72 %, Finland 83.79 %, and Sweden 117.93 %.
H6: Trading volume of the stock decreases on the dividend announcement day, if the firm announces decreasing dividend	-	-	-	-	Rejected	Rejected in all countries	Results show statistically significant and positive AAVs for all sample groups on the event day: Full sample 97.66 %, Denmark 79.67 %, Finland 97.58 %, and Sweden 101.96 %.
H7: The stock price reaction following the dividend announcement is more pronounced for mid-cap firms compared to large-cap firms	Accepted	-	Rejected	-	Accepted	-	The results show that CAARs are higher for all dividend announcements of mid-cap firms, except for constant dividend change announcements
H8: The trading volume response of the stock following the dividend announcement is more pronounced for mid-cap firms compared to large-cap firms	Accepted	-	Accepted	-	Accepted	-	Results show that CAAVs are higher for all dividend announcements of mid-cap firms.

The results suggest that dividend announcements have an abnormal effect on stock returns. The results show positive AARs for dividend increases implying that the stock market reacts to increasing dividend positively. This supports the dividend signalling hypothesis which states that the increasing dividend should be followed by a positive stock price reaction. Statistically significant AAR is found for all sample groups, except for Finnish sample. For all sub-sample groups, the results suggest positive AAR on the event day implying positive stock price reaction on the news. According to dividend signalling hypothesis, constant dividend announcements should leave the stock prices unaltered since they should not provide any new or valuable information to the market. The findings of this study support this. Only exception is Finland where stock market reacts to constant dividend announcements negatively and statistically significantly. The results of this study show statistically significant AARs for full sample and Sweden on the event day for dividend decreases, supporting the dividend signalling hypothesis. For all sub-sample groups, the results suggest negative AARs on the event day implying negative stock market reaction on the dividend decrease announcement news. The findings also show that dividend announcements have signalling effect in market and support the informational content of dividends. The findings of this study show that stock market reacts to dividend change announcements differently depending on the announcement type.

The results of this thesis are consistent with the international evidence for dividend increase announcement being followed by a positive stock price reaction. Dasilas & Leventis (2011) show that stock prices tend to react positively on dividend increase announcements and negatively on dividend decrease announcements in Greece stock market. This is consistent with the findings of this study. Gurgul et al. (2003) found 0.72 % AAR for dividend increases and negative -1.26 % AAR for dividend decreases. In this study, the results suggest 0.63 % AAR for dividend increases and -0.80 % AAR for dividend decreases which are lower compared to the findings by Gurgul et al. (2003) in Austrian stock market. Previous research in Nordic market has reported substantial differences between Nordic countries (Liljeblom et. 2015) which is consistent with the findings of this study. Differences between the countries might be a consequence of size differences between the national stock markets and different tax treatment among the shareholders. Notable is that in this study the largest sample size in country level research was in Sweden which might partially explain the differences in results of Denmark and Finland compared to total sample including all Nordic countries.

Dividend announcements have effect on the trading volume of the stock upon the announcements. According to the results of this study any form of dividend announcement reflects to market as increased trading volume. This implies that shareholders are increasing their interest towards the firm despite the announced direction of the dividend. For dividend increases the results show positive abnormal returns and an increase in trading volume for all sample groups unlike for dividend decreases the abnormal returns are negative on the event day but the trading volume moves to an opposite direction suggesting increasing trading volume. The results of this study are consistent with the findings by Gurgul et al. (2003) who argue that any form of dividend announcement is followed by a positive change in trading volume.

The similar reactions in shareholders' trading behaviour can be explained with the clientele effect. According to clientele effect investors are sorted to different groups according to their beliefs and behaviour (Miller & Modigliani 1961). Investors who expect growing dividend react positively on the increasing dividend announcement news. Similarly, investors might see the decreasing dividend as an opportunity of the firm to invest the profit of the firm prosperously instead for sharing it to shareholders. Investors who do not expect any dividend changes and prefer stable dividend might see a constant dividend as good news from the firm since the firm is investing part of its profit to business opportunities instead of sharing the extra profit to investors. Therefore, the trading volume reflects the sum of differences in reactions of traders (Gurgul et al. 2003) and the changes in trading volumes are a consequence of different clientele. Unlike stock price reactions the results of this study suggest similar reactions in trading volumes for all Nordic countries under investigation. Only the magnitude differs, suggesting the highest AAV for Sweden for all dividend announcements.

In this study the aim was also to examine do the stock market reactions on the dividend announcements differ between firms based on their market values. According to the dividend signalling hypothesis smaller firms should be prone to more pronounced reactions compared to larger firms (Günther 2017). The results of this study show that CAARs are higher for all dividend announcements of mid-cap firms, except for constant dividend change announcements. These differences between mid-cap firms and large-cap firms might be a consequence of lower transparency of the smaller firms compared to larger firms and higher expectations against the smaller firms set by shareholders. Similarly, the results show that

CAAVs are higher for all dividend announcements of mid-cap firms. According to the results all dividend announcements are followed by a positive change in trading volume for both mid-cap and large-cap firms implying that the stock market reacts positively on all dividend announcements regardless of the market cap of the firm. Although the findings of this study suggest that the stock market reacts more pronounced for mid-cap firm's announcements by increasing the trading volume more significantly compared to large-cap firms. The findings show that the trading volume is negatively associated with the market cap of the firm. The results are consistent with the previous research that argues that smaller firms have higher trading volume responses on dividend change announcements (Günther 2017; Ziebart 1990). The results can be explained with clientele effect since an announced news from the smaller unknown firm might draw investors' attention more compared to larger well-known firms.

One of the key findings of this thesis is that the dividend announcements have an abnormal effect on stock returns but the magnitude of the change in stock prices differs between the announcement types. Secondly the results of this study suggest that any form of dividend announcement results in increased trading volume regardless of the direction of change in dividend policy. Last, the findings of this study show that there are significant differences between Nordic countries and in the reactions between the firms of different size. Overall, the findings of this study support the informational content of dividends. In addition, the findings of this study suggest that investors can earn abnormal returns upon the dividend announcements.

6.1 Limitations and future research

Results of this study may be affected by some potential biases. First, the sample sizes decreased substantially in country level analyses, especially in samples of Denmark and Finland. This should be considered when analysing the results since it has been argued that larger sample sizes lead to more improved results (Vaihekoski 2004, 230−232). Despite the smaller sample sizes in country level analysis, this thesis found evidence for the informational content of dividends in Nordic region both in regional level and country level. Second limitation that should be considered are the market indices used in this study. The OMX Nordic 40 Index was used as a benchmark index for full sample. Since the index

includes only 40 firms, including also firms listed in OMX Iceland, all the firms in this study are not included to the index. Same issue should be considered in country level research where OMX Copenhagen 20 Index, OMX Helsinki 25 Index and OMX Stockholm 30 Index were used. Third limitation that should be noted is that the some of the events used in this study include joint announcements of dividends and earnings. Therefore, one cannot be certain whether the stock market reactions are pure reactions on dividend announcements or joint reactions on two separate news of the firms. This thesis did not consider the transaction costs in returns estimation and therefore the proposed abnormal returns may actually differ. Last, to consider, the results of this study cannot be generalized in other markets.

In further research, the model used in this research could be expanded. Much of the previous research has used event study methodology in the research examining the effect of dividend announcements on stock market (Chen et al. 2009; Dasilas & Leventis 2011; Gurgul et al. 2003; Günther 2017). Some of the previous research has also included cross-sectional regression analysis in the analysis (Chen et al. 2009; Gurgul et al. 2003; Günther 2017) and this method could be used to compare the results achieved from the study. This study examined only one firm level variable, market capitalization of the firm. In future research, more firm level variables could be included to get more specific information what firm-level factors affect on the stock market reactions upon the dividend announcements. Previous research has argued that the capital structure of the firm plays an important role in Nordic dividend policy. Nordic firms are generally conservative with debt and aim to keep a margin for safety. (Brunzell et al. 2014) Therefore, including firm level variables of capital structure of the firm would be interesting topic to research in Nordic region. This study has also its focus on short-term stock price reactions. Therefore, expanding the event window would be one future research suggestions as well. It would be especially interesting to investigate the trading volume changes during longer period and compare differences in pre-event and post-event periods upon the dividend announcements providing more specific information of the trading behaviour of the investors.

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Appendices

Appendix 1. Summary of the previous research

Authors	Efficient market hypothesis	Dividend Irrelevance theory	Dividend signalling hypothesis	Agency cost theory	Clientele effect hypothesis
Al-Shattarat & Al-Shattarat (2013)		*Partially accepted*	*Accepted*		
Araujo et al. (2011)		*Accepted*	*Rejected*		
Bechmann & Raaballe (2007)			*Accepted*		
Benartzi et al. (1997)			*Rejected*		
Bernheim & Wantz (1995)			*Rejected*	*Rejected*	
Brennan (1971)		*Accepted*	*Rejected*		
Brunzell et al. (2014)			*Partially accepted*	*Accepted*	*Partially accepted*
Chen et al. (2002)		*Accepted*	*Rejected*		
Chen et al. (2009)		*Accepted*	*Partially accepted*		
Christie (1994)			*Rejected*	*Rejected*	
Dahlqvist et al. (2014)					*Partially accepted*
Dasilas et al. (2008)		*Rejected*	*Accepted*		
Dasilas & Leventis (2011)		*Rejected*	*Accepted*		
Downes & Heinekel (1982)			*Rejected*	*Rejected*	
Dsouza & Mallikarjunappa (2015)	*Rejected*				
Fama (1970)	*Accepted*				
Gurgul et al. (2003)		*Rejected*	*Accepted*		
Günther (2017)	*Rejected*		*Accepted*		
Hasan (2022)		*Rejected*	*Accepted*		
Kumar et al. (2020)	*Partially accepted*				
Kawano (2014)					*Accepted*
La Porta et al. (2000)				*Accepted*	
Legenzova et al. (2017)	*Rejected*		*Rejected*		
Li & Zhao (2008)			*Rejected*		
Linden et al. (2021)			*Partially accepted*		
Liljeblom et al. (2015)			*Partially accepted*		
Miller & Modigliani (1961)		*Accepted*	*Rejected*		
Miller & Scholes (1982)					*Rejected*
Rahman et al. (2021)	*Rejected*				
Watts (1973)			*Rejected*		

Appendix 2. List of the firms

Company Name	Country/ Region	MC	Dividend Increases	Constant Dividends	Dividend Decreases	Total
ALM. Brand A/S	DK	LARGE	2	1	1	4
Ambu A/S	DK	LARGE	0	1	3	4
AP Moeller - Maersk A/S	DK	LARGE	2	3	0	5
Broedrene Hartmann A/S	DK	MID	0	2	0	2
Carlsberg A/S	DK	LARGE	2	0	0	2
Cbrain A/S	DK	MID	4	1	0	5
Chemometec A/S	DK	LARGE	2	0	1	3
Chr Hansen Holding A/S	DK	LARGE	3	0	1	4
Coloplast A/S	DK	LARGE	5	0	0	5
Columbus A/S	DK	MID	0	3	0	3
Copenhagen Airports A/S	DK	LARGE	1	0	1	2
Dampskibsselskabet Norden A/S	DK	LARGE	3	0	0	3
Danske Andelskassers Bank A/S	DK	MID	0	0	2	2
Danske Bank A/S	DK	LARGE	0	2	2	4
DFDS AS	DK	LARGE	0	3	0	3
DSV A/S	DK	LARGE	3	0	0	3
FLSmidth & Co A/S	DK	LARGE	3	0	2	5
Flugger group A/S	DK	MID	1	2	2	5
Gabriel Holding A/S	DK	MID	4	0	1	5
GN Store Nord A/S	DK	LARGE	3	1	0	4
Gyldendal A/S	DK	MID	0	5	0	5
ISS A/S	DK	LARGE	0	3	0	3
Jeudan A/S	DK	LARGE	0	2	2	4
Jyske Bank A/S	DK	LARGE	2	0	0	2
Laan & Spar Bank A/S	DK	MID	2	2	1	5
Matas A/S	DK	MID	0	1	2	3
NNIT A/S	DK	MID	2	0	2	4
North Media A/S	DK	MID	2	1	0	3
Novo Nordisk A/S	DK	LARGE	3	0	0	3
Novozymes A/S	DK	LARGE	2	1	0	3
Orsted A/S	DK	LARGE	5	0	0	5
Pandora A/S	DK	LARGE	0	2	0	2
Per Aarsleff Holding A/S	DK	MID	4	1	0	5
Ringkjoebing Landbobank A/S	DK	MID	1	0	1	2
Rockwool A/S	DK	LARGE	4	1	0	5
Royal Unibrew A/S	DK	LARGE	1	0	0	1
Rtx A/S	DK	MID	0	1	0	1
Scandinavian Tobacco Group A/S	DK	LARGE	4	0	0	4
Schouw & Co A/S	DK	LARGE	3	2	0	5
Simcorp A/S	DK	LARGE	2	1	0	3
Solar A/S	DK	MID	3	1	1	5
Spar Nord Bank A/S	DK	LARGE	1	2	2	5

Sparekassen Sjaelland-Fyn A/S	DK	MID	2	0	1	3
Sydbank A/S	DK	LARGE	0	0	1	1
Tivoli A/S	DK	MID	2	1	0	3
Topdanmark A/S	DK	LARGE	2	0	3	5
Tryg A/S	DK	LARGE	3	0	2	5
Vestas Wind Systems A/S	DK	LARGE	2	0	2	4
Aktia Bank Abp	FI	MID	2	0	2	4
Alandsbanken Abp	FI	MID	5	0	0	5
Aspo Oyj	FI	MID	3	1	1	5
Atria Oyj	FI	MID	4	0	1	5
Bittium Oyj	FI	MID	1	0	0	1
CapMan Oyj	FI	MID	0	0	1	1
Cargotec Corp	FI	LARGE	0	1	0	1
Caverion Oyj	FI	MID	1	0	0	1
Citycon Oyj	FI	LARGE	0	2	0	2
Elisa Oyj	FI	LARGE	2	0	0	2
eQ Oyj	FI	MID	5	0	0	5
Etteplan Oyj	FI	MID	1	0	1	2
Fellow Pankki Oyj	FI	MID	4	1	0	5
Finnair Oyj	FI	MID	0	0	1	1
Fortum Oyj	FI	LARGE	1	1	0	2
HKScan Oyj	FI	MID	1	0	2	3
Huhtamaki Oyj	FI	LARGE	1	0	0	1
Kamux Oyj	FI	MID	2	0	3	5
Kemira Oyj	FI	LARGE	0	1	1	2
Kesko Oyj	FI	LARGE	1	0	1	2
Kone Oyj	FI	LARGE	2	1	0	3
Konecranes Abp	FI	LARGE	1	1	1	3
Lassila & Tikanoja Oyj	FI	MID	1	0	1	2
Marimekko Oyj	FI	MID	4	0	0	4
Metsa Board Oyj	FI	LARGE	1	2	1	4
Neste Oyj	FI	LARGE	1	0	1	2
NoHo Partners Oyj	FI	MID	2	0	1	3
Nokian Tyres plc	FI	LARGE	2	0	2	4
Nordea Bank Abp	FI	LARGE	3	0	2	5
Olvi Oyj	FI	MID	4	0	1	5
Oriola Oyj	FI	MID	0	1	2	3
Orion Oyj	FI	LARGE	1	2	0	3
Outokumpu Oyj	FI	LARGE	0	0	1	1
Pihlajalinna Oyj	FI	MID	3	0	1	4
Ponsse Oyj	FI	MID	3	1	1	5
Raisio Oyj	FI	MID	0	1	1	2
Revenio Group Oyj	FI	LARGE	4	0	1	5
Rovio Entertainment Oyj	FI	MID	1	3	1	5
Sampo plc	FI	LARGE	1	0	1	2

Sanoma Oyj	FI	LARGE	1	0	0	1
Scanfil Oyj	FI	MID	5	0	0	5
Stora Enso Oyj	FI	LARGE	3	0	1	4
Taaleri Oyj	FI	MID	2	0	0	2
Terveystalo Oyj	FI	LARGE	1	0	0	1
Tietoevry Oyj	FI	LARGE	1	0	0	1
Tokmanni Group Oyj	FI	MID	3	1	1	5
UPM-Kymmene Oyj	FI	LARGE	1	2	0	3
Vaisala Oyj	FI	LARGE	1	0	0	1
Valmet Oyj	FI	LARGE	1	0	0	1
Viking Line Abp	FI	MID	0	1	1	2
Wartsila Oyj Abp	FI	LARGE	0	0	1	1
YIT Oyj	FI	MID	0	0	1	1
AAK AB (publ)	SE	LARGE	3	0	1	4
AcadeMedia AB	SE	MID	2	1	1	4
AddLife AB	SE	LARGE	3	1	0	4
Addnode Group AB (publ)	SE	LARGE	1	3	0	4
Addtech AB	SE	LARGE	3	0	1	4
Afry AB	SE	LARGE	2	3	0	5
Alfa Laval AB	SE	LARGE	2	1	0	3
Alimak Group AB (publ)	SE	MID	4	0	1	5
Alligo AB	SE	MID	2	0	1	3
Ambea AB (publ)	SE	MID	3	1	1	5
AQ Group AB	SE	MID	1	3	0	4
Assa Abloy AB	SE	LARGE	3	0	2	5
Atlas Copco AB	SE	LARGE	2	0	1	3
Atrium Ljungberg AB	SE	LARGE	5	0	0	5
Attendo AB (publ)	SE	MID	1	0	1	2
Avanza Bank Holding AB	SE	LARGE	1	2	2	5
Axfood AB	SE	LARGE	2	2	1	5
Balco Group AB	SE	MID	2	0	2	4
Beijer Alma AB	SE	MID	2	1	2	5
Beijer Electronics Group AB	SE	MID	0	3	0	3
Beijer Ref AB (publ)	SE	LARGE	3	0	2	5
Bergman & Beving AB	SE	MID	3	0	1	4
Besqab AB (publ)	SE	MID	1	3	1	5
Bilia AB	SE	LARGE	2	0	3	5
Billerud AB (publ)	SE	LARGE	1	3	1	5
Biogaia AB	SE	MID	1	0	3	4
Biotage AB	SE	LARGE	4	0	1	5
Boliden AB	SE	LARGE	0	0	1	1
Bonava AB (publ)	SE	MID	3	1	1	5
Bravida Holding AB	SE	LARGE	5	0	0	5
BTS Group AB	SE	MID	3	0	2	5
Bufab AB (publ)	SE	LARGE	4	1	0	5

Bulten AB	SE	MID	3	1	1	5
Bure Equity AB	SE	LARGE	3	1	1	5
Byggmax Group AB	SE	MID	3	0	1	4
Castellum AB	SE	LARGE	4	0	1	5
Catella AB	SE	MID	3	1	1	5
Catena AB	SE	LARGE	4	0	1	5
CellaVision AB	SE	MID	1	3	1	5
Clas Ohlson AB	SE	MID	1	2	0	3
Cloetta AB	SE	MID	3	1	1	5
Concentric AB	SE	MID	5	0	0	5
Coor Service Management Holding AB	SE	MID	4	0	1	5
Corem Property Group AB	SE	MID	3	0	2	5
CTT Systems AB	SE	MID	2	1	2	5
Dios Fastigheter AB	SE	LARGE	2	1	2	5
Dometic Group AB (publ)	SE	LARGE	5	0	0	5
Duni AB	SE	MID	0	2	1	3
Dustin Group AB	SE	MID	2	0	2	4
Eastnine AB (publ)	SE	MID	3	1	1	5
Elanders AB	SE	MID	3	2	0	5
Electrolux AB	SE	LARGE	2	0	1	3
Elekta AB (publ)	SE	LARGE	2	1	0	3
Elos Medtech AB	SE	MID	1	1	1	3
Eolus Vind AB (publ)	SE	MID	1	2	1	4
Essity AB (publ)	SE	LARGE	4	1	0	5
Evolution AB (publ)	SE	LARGE	3	0	1	4
Ework Group AB	SE	MID	3	1	1	5
Fabege AB	SE	LARGE	2	0	3	5
Fagerhult AB	SE	MID	1	1	3	5
FastPartner AB	SE	LARGE	3	0	0	3
FM Mattsson AB (publ)	SE	MID	2	2	0	4
G5 Entertainment AB (publ)	SE	MID	3	2	0	5
Garo AB	SE	MID	3	1	1	5
Getinge AB	SE	LARGE	3	0	2	5
Granges AB	SE	MID	4	0	1	5
H & M Hennes & Mauritz AB	SE	LARGE	1	3	0	4
HEBA Fastighets AB	SE	MID	4	0	1	5
Hexagon AB	SE	LARGE	3	0	1	4
Hexatronic Group AB	SE	LARGE	1	3	1	5
Hexpol AB	SE	LARGE	4	1	0	5
HMS Networks AB	SE	LARGE	3	0	1	4
Hoist Finance AB (publ)	SE	MID	1	0	0	1
Holmen AB	SE	LARGE	2	0	1	3
Hufvudstaden AB	SE	LARGE	2	0	0	2
Humana AB	SE	MID	2	1	0	3
Husqvarna AB	SE	LARGE	3	1	1	5

IAR Systems Group AB	SE	MID	0	2	1	3
Industrivarden AB	SE	LARGE	5	0	0	5
Indutrade AB	SE	LARGE	4	0	1	5
Instalco AB	SE	LARGE	3	0	2	5
Intrum AB	SE	LARGE	4	1	0	5
Investment AB Latour	SE	LARGE	3	0	2	5
Investment Oresund AB	SE	MID	2	1	1	4
Investor AB	SE	LARGE	1	3	1	5
Invisio AB	SE	MID	3	1	1	5
Inwido AB (publ)	SE	MID	3	1	1	5
ITAB Shop Concept AB	SE	MID	0	1	0	1
JM AB	SE	LARGE	3	0	1	4
Kinnevik AB	SE	LARGE	1	0	1	2
Knowit AB (publ)	SE	MID	4	0	1	5
L E Lundbergforetagen AB (publ)	SE	LARGE	3	0	1	4
Lagercrantz Group AB	SE	LARGE	2	1	1	4
Lifco AB (publ)	SE	LARGE	3	0	1	4
Lindab International AB	SE	LARGE	4	0	1	5
Loomis AB	SE	LARGE	4	0	1	5
Medicover AB	SE	LARGE	2	0	1	3
Meko AB	SE	MID	0	1	1	2
Mips AB	SE	LARGE	3	0	1	4
Mycronic AB (publ)	SE	LARGE	3	1	1	5
Ncc AB	SE	LARGE	2	1	2	5
Nederman Holding AB	SE	MID	3	0	1	4
New Wave Group AB	SE	LARGE	4	0	0	4
Nibe Industrier AB	SE	LARGE	3	0	1	4
Nobia AB	SE	MID	3	0	1	4
Nolato AB	SE	LARGE	3	0	1	4
Note AB (publ)	SE	MID	2	0	1	3
NP3 Fastigheter AB	SE	LARGE	4	0	1	5
OEM International AB	SE	MID	3	0	0	3
Pandox AB	SE	LARGE	2	0	1	3
Peab AB	SE	LARGE	4	1	0	5
Platzer Fastigheter Holding AB (publ)	SE	LARGE	4	0	1	5
Pricer AB	SE	MID	3	1	1	5
Proact IT Group AB	SE	MID	3	0	2	5
Probi AB	SE	MID	2	1	0	3
Ratos AB	SE	LARGE	3	1	1	5
Rejlers AB (publ)	SE	MID	3	0	1	4
Resurs Holding AB (publ)	SE	MID	1	1	2	4
Rottneros AB	SE	MID	1	3	0	4
Saab AB	SE	LARGE	3	1	1	5
Sagax AB	SE	LARGE	4	0	1	5
Sandvik AB	SE	LARGE	4	0	1	5

Scandi Standard AB (publ)	SE	MID	3	1	1	5
Scandic Hotels Group AB	SE	MID	2	0	1	3
Securitas AB	SE	LARGE	4	0	1	5
Skandinaviska Enskilda Banken AB	SE	LARGE	4	0	1	5
Skanska AB	SE	LARGE	2	1	2	5
SKF AB	SE	LARGE	3	1	1	5
SkiStar AB	SE	MID	2	0	2	4
SSAB AB	SE	LARGE	3	0	1	4
Svenska Cellulosa SCA AB	SE	LARGE	3	1	1	5
Svenska Handelsbanken AB	SE	LARGE	2	2	1	5
Sweco AB (publ)	SE	LARGE	3	0	2	5
Swedbank AB	SE	LARGE	2	0	3	5
Systemair AB	SE	LARGE	1	2	1	4
Tele2 AB	SE	LARGE	3	0	2	5
Telefonaktiebolaget LM Ericsson	SE	LARGE	2	2	1	5
Telia Company AB	SE	LARGE	4	0	1	5
Tethys Oil AB	SE	MID	1	0	0	1
TF Bank AB	SE	MID	3	1	1	5
Thule Group AB	SE	LARGE	4	0	0	4
Traction AB	SE	MID	4	0	1	5
Trelleborg AB	SE	LARGE	4	0	1	5
Troax Group AB (publ)	SE	LARGE	4	0	1	5
VBG Group AB (publ)	SE	MID	4	0	1	5
Vitec Software Group AB (publ)	SE	LARGE	4	0	1	5
Vitrolife AB	SE	LARGE	2	1	2	5
Volati AB	SE	LARGE	4	1	0	5
Volvo AB	SE	LARGE	5	0	0	5
Wallenstam AB	SE	LARGE	3	0	2	5
Wihlborgs Fastigheter AB	SE	LARGE	3	0	1	4
XANO Industri AB	SE	MID	1	1	2	4

Appendix 3. Market Adjusted Return model

$$AR_{it} = R_{it} - R_{mt} \quad (21)$$

Appendix 4. Daily average abnormal returns (AAR) of the dividend announcements using the market adjusted return model setting α = 0 and β = 1. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample			*Denmark*			*Finland*			*Sweden*		
DAYS	***AAR %***		***t-statistics***	***AAR %***		***t-statistics***	***AAR %***		***t-statistics***	***AAR %***		***t-statistics***
						Dividend Increases						
-5	-0.20 %	**	-2.40	0.21 %		1.23	-0.17 %		-0.90	-0.31 %	***	-2.81
-4	-0.03 %		-0.36	0.09 %		0.66	-0.01 %		-0.03	-0.06 %		-0.60
-3	0.17 %	*	1.80	-0.07 %		-0.47	0.77 %	***	4.23	0.10 %		0.77
-2	0.18 %	*	1.92	0.02 %		0.13	0.00 %		0.00	0.25 %	**	2.11
-1	0.28 %	*	1.86	0.82 %		1.05	0.41 %	**	2.09	0.13 %		1.09
0	0.57 %	***	2.59	0.63 %		1.33	0.01 %		0.02	0.67 %	**	2.38
1	0.38 %	***	2.96	0.22 %		1.11	0.32 %		1.03	0.43 %	**	2.57
2	-0.17 %		-1.11	-0.88 %		-1.13	-0.10 %		-0.39	-0.03 %		-0.23
3	0.10 %		1.14	-0.11 %		-0.97	0.14 %		0.58	0.14 %		1.24
4	-0.27 %	***	-2.95	0.25 %		1.43	-0.34 %		-1.66	-0.37 %	***	-3.20
5	-0.29 %	***	-3.39	-0.04 %		-0.28	-0.19 %		-0.69	-0.37 %	***	-3.58
						Constant Dividends						
-5	0.06 %		0.14	1.24 %		0.81	-0.53 %	*	-1.73	-0.35 %	*	-1.91
-4	-0.46 %		-1.03	-1.57 %		-0.99	-0.64 %	*	-1.73	0.08 %		0.33
-3	-0.11 %		-0.68	-0.44 %		-1.22	-0.38 %		-0.84	0.10 %		0.49
-2	0.24 %		1.28	0.15 %		0.39	0.46 %		1.14	0.24 %		0.94
-1	-0.12 %		-0.64	-0.15 %		-0.42	0.12 %		0.36	-0.15 %		-0.62
0	-0.80 %		-1.62	-0.11 %		-0.15	-3.04 %	**	-2.28	-0.63 %		-0.92
1	-0.43 %	*	-1.70	-0.31 %		-0.67	-1.19 %	*	-2.00	-0.31 %		-0.92
2	-0.17 %		-0.35	-1.45 %		-0.91	1.01 %		1.56	0.16 %		0.56
3	-0.16 %		-0.77	-0.22 %		-0.80	0.40 %		0.61	-0.25 %		-0.88
4	0.26 %		0.58	1.31 %		0.86	-1.08 %	**	-2.41	0.07 %		0.27
5	-0.68 %		-1.58	-2.03 %		-1.33	-0.26 %		-0.51	-0.16 %		-0.90
						Dividend Decreases						
-5	-0.24 %		-1.32	0.68 %	**	2.15	0.26 %		0.71	-0.58 %	**	-2.45
-4	-0.14 %		-0.84	-0.26 %		-0.72	-0.05 %		-0.12	-0.13 %		-0.63
-3	-0.20 %		-1.10	-0.15 %		-0.37	0.35 %		1.12	-0.35 %		-1.45
-2	0.21 %		1.27	0.44 %		1.21	0.62 %		1.49	0.05 %		0.24
-1	0.03 %		0.16	0.17 %		0.36	0.13 %		0.51	-0.03 %		-0.10
0	-0.82 %	**	-2.10	-0.41 %		-0.44	-0.75 %		-0.94	-0.94 %	*	-1.87
1	0.04 %		0.15	1.51 %	***	3.09	-0.76 %		-1.46	-0.11 %		-0.36
2	0.02 %		0.12	0.21 %		0.38	0.48 %		1.12	-0.14 %		-0.62
3	-0.11 %		-0.65	-0.89 %	**	-2.50	0.06 %		0.14	0.03 %		0.14
4	-0.41 %	***	-2.75	0.16 %		0.41	-0.74 %	**	-2.09	-0.46 %	**	-2.58
5	0.01 %		0.04	-0.29 %		-1.00	-0.21 %		-0.46	0.13 %		0.72

Appendix 5. Cumulative average abnormal returns (CAAR) of the dividend announcements using the market adjusted return model setting α = 0 and β = 1. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample		*Denmark*		*Finland*		*Sweden*	
[t1,t2]	***CAAR %***	***t-statistics***	***CAAR %***	***t-statistics***	***CAAR %***	***t-statistics***	***CAAR %***	***t-statistics***
				Dividend Increases				
[-5,-1]	0.39 % **	2.05	1.08 %	1.34	1.01 % **	2.40	0.11 %	0.57
[-3,-1]	0.63 % ***	3.64	0.77 %	0.97	1.18 % ***	3.67	0.48 % ***	3.03
[-1,+1]	1.23 % ***	3.97	1.68 %	1.48	0.74 %	1.30	1.23 % ***	3.56
[0,0]	0.57 % ***	2.59	0.63 %	1.33	0.01 %	0.02	0.67 % **	2.38
[0,+1]	0.95 % ***	3.73	0.85 % *	1.83	0.32 %	0.63	1.10 % ***	3.32
[0,+3]	0.88 % ***	3.13	-0.14 %	-0.22	0.37 %	0.61	1.22 % ***	3.47
[0,+5]	0.32 %	1.05	0.07 %	0.10	-0.16 %	-0.24	0.48 %	1.25
				Constant Dividends				
[-5,-1]	-0.39 %	-0.63	-0.78 %	-0.37	-0.97 %	-1.20	-0.08 %	-0.23
[-3,-1]	0.02 %	0.07	-0.44 %	-0.89	0.20 %	0.30	0.19 %	0.59
[-1,+1]	-1.34 % **	-2.54	-0.58 %	-0.67	-4.11 % **	-2.69	-1.09 %	-1.54
[0,0]	-0.80 %	-1.62	-0.11 %	-0.15	-3.04 % **	-2.28	-0.63 %	-0.92
[0,+1]	-1.23 % **	-2.20	-0.42 %	-0.49	-4.23 % **	-2.78	-0.94 %	-1.22
[0,+3]	-1.55 % **	-2.23	-2.09 %	-1.24	-2.82 % *	-1.91	-1.03 %	-1.25
[0,+5]	-1.97 % **	-2.15	-2.81 %	-1.00	-4.16 % **	-2.60	-1.12 %	-1.40
				Dividend Decreases				
[-5,-1]	-0.33 %	-1.06	0.87 %	1.31	1.30 % ***	2.73	-1.03 % **	-2.50
[-3,-1]	0.04 %	0.14	0.46 %	0.67	1.10 % **	2.51	-0.33 %	-0.90
[-1,+1]	-0.75 %	-1.46	1.27 %	1.24	-1.37 %	-1.31	-1.08 %	-1.59
[0,0]	-0.82 % **	-2.10	-0.41 %	-0.44	-0.75 %	-0.94	-0.94 % *	-1.87
[0,+1]	-0.79 % *	-1.70	1.10 %	1.21	-1.51 %	-1.42	-1.05 % *	-1.77
[0,+3]	-0.87 % *	-1.73	0.42 %	0.40	-0.97 %	-0.76	-1.16 % *	-1.82
[0,+5]	-1.28 % **	-2.49	0.29 %	0.26	-1.93 %	-1.41	-1.49 % **	-2.35

Appendix 6. Daily average abnormal trading volumes (AAV) of the dividend announcements using the market adjusted return model setting α = 0 and β = 1. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample			*Denmark*			*Finland*			*Sweden*		
DAYS	***AAV %***		***t-statistics***	***AAV %***		***t-statistics***	***AAV %***		***t-statistics***	***AAV %***		***t-statistics***
						Dividend Increases						
-5	-0.47 %		-0.15	0.17 %		0.03	-6.46 %		-0.78	0.67 %		0.17
-4	0.76 %		0.24	4.98 %		0.89	9.50 %		1.04	-2.08 %		-0.53
-3	2.92 %		0.87	-1.16 %		-0.13	-2.95 %		-0.30	5.11 %		1.31
-2	7.68 %	**	2.47	4.52 %		0.90	24.34 %	***	2.79	4.83 %		1.24
-1	14.34 %	***	4.77	8.28 %		0.92	21.54 %	***	2.67	14.18 %	***	4.15
0	81.81 %	***	23.32	26.51 %	***	3.56	67.05 %	***	9.34	97.54 %	***	23.03
1	-27.67 %	***	-8.15	-9.88 %		-1.17	-36.23 %	***	-4.60	-29.88 %	***	-7.19
2	-24.83 %	***	-7.36	-22.99 %	***	-3.11	-18.24 %	**	-2.09	-26.66 %	***	-6.40
3	-16.78 %	***	-5.35	-6.97 %		-1.03	-23.90 %	***	-2.76	-17.47 %	***	-4.57
4	-8.29 %	***	-2.88	-4.26 %		-0.69	-7.87 %		-1.17	-9.29 %	**	-2.56
5	-7.53 %	**	-2.58	8.44 %		1.51	-12.30 %		-1.36	-10.13 %	***	-2.90
						Constant Dividends						
-5	-6.07 %		-0.87	-4.53 %		-0.24	4.20 %		0.27	-9.00 %		-1.22
-4	-1.37 %		-0.22	-6.04 %		-0.42	-19.52 %	**	-2.10	4.70 %		0.61
-3	-0.26 %		-0.04	-3.77 %		-0.22	11.53 %		1.06	-1.23 %		-0.15
-2	10.37 %		1.43	18.37 %		0.93	11.46 %		1.49	6.49 %		0.79
-1	17.53 %	***	2.80	13.91 %		0.95	25.62 %	**	2.30	17.41 %	**	2.23
0	98.09 %	***	13.64	64.36 %	***	4.62	81.95 %	***	6.16	116.97 %	***	12.42
1	-47.23 %	***	-7.77	-40.39 %	***	-2.81	-32.97 %	**	-2.47	-53.44 %	***	-7.35
2	-15.99 %	***	-2.65	4.70 %		0.35	-13.22 %		-0.89	-26.02 %	***	-3.55
3	-12.34 %	**	-2.31	-14.15 %		-1.37	-21.43 %	*	-1.74	-9.54 %		-1.34
4	-8.99 %		-1.28	-8.70 %		-0.49	-9.15 %		-0.69	-9.09 %		-1.11
5	-6.27 %		-0.92	0.90 %		0.07	-17.08 %		-1.07	-7.18 %		-0.79
						Dividend Decreases						
-5	-2.33 %		-0.43	-3.49 %		-0.20	-17.11 %		-1.29	1.67 %		0.27
-4	-9.44 %	*	-1.87	-8.89 %		-0.66	-8.78 %		-0.60	-9.74 %	*	-1.69
-3	11.94 %	**	2.27	18.01 %		1.30	4.44 %		0.34	12.38 %	*	1.95
-2	-2.18 %		-0.43	-12.47 %		-0.88	5.22 %		0.64	-1.59 %		-0.24
-1	16.14 %	***	3.31	10.72 %		0.73	16.17 %		1.35	17.42 %	***	3.08
0	98.53 %	***	18.04	86.11 %	***	5.28	96.82 %	***	7.58	101.91 %	***	15.89
1	-38.84 %	***	-7.37	-17.53 %		-1.04	-56.54 %	***	-4.55	-39.46 %	***	-6.67
2	-23.42 %	***	-5.49	-23.58 %	**	-2.09	-12.27 %		-1.05	-26.19 %	***	-5.28
3	-15.45 %	***	-3.26	-27.87 %	**	-2.32	-20.99 %	*	-1.98	-11.10 %	*	-1.89
4	-6.32 %		-1.20	-1.02 %		-0.06	-0.18 %		-0.02	-9.13 %		-1.51
5	-10.57 %	*	-1.91	5.30 %		0.32	1.04 %		0.12	-17.26 %	***	-2.50

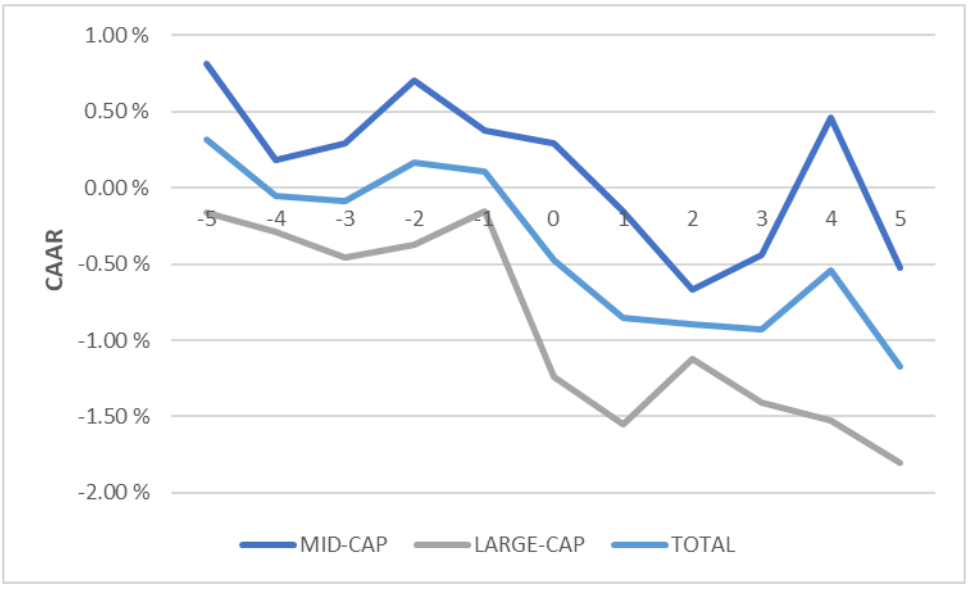
Appendix 7. Cumulative average abnormal trading volumes (CAAV) of the dividend announcements using the market adjusted return model setting α = 0 and β = 1. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

	Full sample			*Denmark*			*Finland*			*Sweden*		
[t1,t2]	***CAAV %***		***t-statistics***	***CAAV %***		***t-statistics***	***CAAV %***		***t-statistics***	***CAAV %***		***t-statistics***
						Dividend Increases						
[-5,-1]	25.23 %	***	6.97	16.78 %	*	1.81	45.97 %	***	4.60	22.70 %	***	5.34
[-3,-1]	24.94 %	***	7.32	11.63 %		1.40	42.93 %	***	4.75	24.11 %	***	5.92
[-1,+1]	68.48 %	***	15.81	24.91 %	**	2.05	52.37 %	***	5.13	81.84 %	***	16.33
[0,0]	81.81 %	***	23.32	26.51 %	***	3.56	67.05 %	***	9.34	97.54 %	***	23.03
[0,+1]	54.13 %	***	13.80	16.63 %		1.62	30.82 %	***	3.52	67.66 %	***	14.56
[0,+3]	12.53 %	***	3.44	-13.33 %	*	-1.67	-11.32 %		-1.13	23.53 %	***	5.45
[0,+5]	-3.28 %		-0.89	-9.16 %		-0.93	-31.49 %	***	-3.29	4.11 %		0.95
						Constant Dividends						
[-5,-1]	20.19 %	**	2.60	17.94 %		0.91	33.30 %	***	3.32	18.36 %	**	1.99
[-3,-1]	27.63 %	***	3.48	28.51 %		1.33	48.61 %	***	2.93	22.66 %	***	2.70
[-1,+1]	68.39 %	***	8.68	37.88 %	*	1.85	74.60 %	***	3.90	80.94 %	***	9.87
[0,0]	98.09 %	***	13.64	64.36 %	***	4.62	81.95 %	***	6.16	116.97 %	***	12.42
[0,+1]	50.87 %	***	6.88	23.97 %		1.53	48.98 %	***	2.63	63.53 %	***	6.99
[0,+3]	22.54 %	***	3.26	14.51 %		0.92	14.33 %		1.04	27.97 %	***	3.24
[0,+5]	7.27 %		0.86	6.71 %		0.35	-11.89 %		-0.69	11.70 %		1.12
						Dividend Decreases						
[-5,-1]	14.13 %	***	2.42	3.89 %		0.19	-0.06 %		0.00	20.13 %	***	3.42
[-3,-1]	25.90 %	***	4.99	16.27 %		1.08	25.82 %	*	1.76	28.21 %	***	4.87
[-1,+1]	75.82 %	***	12.90	79.31 %	***	5.12	56.44 %	***	5.28	79.87 %	***	10.70
[0,0]	98.53 %	***	18.04	86.11 %	***	5.28	96.82 %	***	7.58	101.91 %	***	15.89
[0,+1]	59.69 %	***	11.10	68.58 %	***	3.73	40.28 %	***	4.35	62.45 %	***	9.94
[0,+3]	20.82 %	***	4.10	17.14 %		1.11	7.02 %		0.73	25.16 %	***	4.09
[0,+5]	3.93 %		0.62	21.42 %		1.32	7.88 %		0.81	-1.23 %		-0.15

Appendix 8. Welch's test results for cumulative average abnormal trading volumes (CAAV) of the dividend announcements. Statistical significance levels are presented: * 1 % level, ** 5 % level and * 10 % level.**

[t1,t2]	*Full sample* *Welch t-stat*	*Large cap* *Welch t-stat*	*Mid cap* *Welch t-stat*
	Increase effect compared to decrease effect		
[-1,+1]	-0.54	-0.49	-0.13
[0,0]	-1.18	-0.68	-0.59
[0,+1]	-0.24	0.02	-0.12
	Increase effect compared to constant effect		
[-1,+1]	0.44	0.42	0.49
[0,0]	-1.17	-1.32	0.07
[0,+1]	0.83	0.84	0.66
	Decrease effect compared to constant effect		
[-1,+1]	0.80	0.77	0.56
[0,0]	-0.21	-0.74	0.51
[0,+1]	0.94	0.76	0.71

Appendix 9. CAARs of constant dividend announcements based on market cap



Appendix 10. CAAVs of constant dividend announcements based on market cap