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Share price reaction to dividend announcement

- An event study on the Signaling Model from the Stockholm Stock Exchange

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Abstract

This study examines the dividend announcement effect on the common stock price by a signaling hypothesis approach on the Stockholm Stock Exchange. The event study shows a positive significant cumulative average abnormal return (CAAR) of 1,54 % for positive dividend announcement in the analyst model. For negative- and neutral announcement, the reaction is non-significant. Although, negative dividend announcements have a clear negative CAAR in the event window. The results are robust when analyzing the sample year by year and for different dividend expectation models, and consistent with similar studies for other countries and regions. The overall outcome tends to support the signaling theory that a change in dividends will convey information to the market. Although this paper cannot reject that a dividend change reflects the past, since for the dividend change to have an impact on the share price, it seems like the dividend- and earning announcement has to have the same sign, i.e. either both positive or both negative.

Keywords: Event study, Dividend announcement, Signaling theory, Efficient Market Hypothesis

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1. Introduction

"The effect of a firm's dividend policy on the current price of its shares is a matter of considerable importance, not only to the corporate officials who must set the policy, but to investors planning portfolios and to economists seeking to understand and appraise the functioning of the capital markets."

(Modigliani and Miller, 1961)

The dividend policy has been an issue of great debate for financial theorists within the research of corporate finance, historically. One of the most well-known theorems is the dividend irrelevance hypothesis, based on a paper of Modigliani and Miller (1958), which states that the stakeholder should be indifferent between different payout policies.

From one perspective, dividends are a form of cash recycling, which means that they should not affect the market value of the firm. From another point of view, managers within a firm want to maintain a sustainable dividend policy over time. To do so, managers should set dividends based on the future prospects of the firm, and for this reason, investors will react to dividend announcements. Therefore, if an investor wants to maximize the wealth, it is essential to understand the relationship between a dividend change and the value of the firm. (Elfakhani, 1995)

The dividend signaling theory was first introduced by Ross (1977) and Bhattacharya (1979), in which they assume that insiders have private information, which is not known to the market, about the future prospect of the firm. Although the taxation of dividends is unfavorable in contrast to capital, the insiders might be willing to use dividend announcements as a signaling tool that the company has lucrative projects ahead. Easterbrook (1984) suggest an alternative theory which derives from the agency cost between investors and management. If a firm sets a substantial dividend policy, it will force managers to regulate future projects in order to maintain the determined dividend target. Allen, Bernardo, and Welch (2000) argues that it is the clientele effect, i.e. investors have different preferences when it comes to dividend yield, which determines the level of the dividend.

This study will use the mainstream theory of dividend signaling, by Ross (1977) and Bhattacharya (1979), to investigate how a change in dividend will affect the common stock price. To do so, this paper uses an event study approach, and the focus will be the short-term

effect, which is a similar approach as Capstaff et al. (2004) have conducted on the Oslo Stock Exchange and Aharony & Swary (1980) on the New York Stock Exchange.

As a consequence of the event study approach on the short term effect, this study will briefly examine whether the dividend announcement follows the efficient market hypothesis (EMH). The EMH has been one of the most controversial hypotheses in the financial research since Fama (1965) introduced the concept of efficient markets to the public. This study will use three event windows, [-3, -2], [-1, +1] and [+2, +3], to examine the EMH. To be able to investigate the abnormal return on the stock price in the days surrounding the dividend announcement day.

A major difficulty in examining the dividend announcement effect in Sweden is that firm's, in general, announce the dividend in connection with the interim report for the fourth quarter (Q4). To produce reliable and robust results, this study has removed significant confounding events, such as share- and bond issues. Furthermore, two separate dividend expectation model has been chosen, and this study also investigates the data sample year by year. Although, one must have in mind that an interim report consists of a lot of information. Information, such as a change in management, order bookings, and new products, have not been considered in this paper.

This paper's aim is to contribute to existing dividend signaling research and highlight any difference between the Swedish market and already examined markets. In order to deepen the understanding of this concept and hopefully facilitate for investors and firm's management in their decisions making.

This study finds statistically significant positive CAAR of 0,69 % for the naive model, where firm's increase their dividend in relation to the previous year, and 1,54 % for the analyst model, where firm's increase their dividend more than the analyst's consensus. For neutral dividend announcements, in which the dividend are at the same level as the previous year or the same level as the analyst's consensus, this paper finds no significant results. For negative dividend announcements, where firm's cut their dividend in relation to previous year or reports dividend lower than analyst consensus, this study finds no significant results either. Even though there seems to be a negative CAAR for the negative announcement, these results are not significant. The results for positive-, neutral- and negative dividend announcements are consistent with similar studies of Capstaff et al. (2004) and Aharony & Swary (1980).

Furthermore, when firms are categorized into portfolios based on whether the dividend- and earning announcements are above or below the financial analysts' consensus, this paper finds significant reactions for portfolios where dividend- and earning announcements are both above or both below the consensus. For portfolios of positive (negative) dividend- and earning announcements the CAAR is 2,21 % (-2,05 %).

1.1. Structure

The paper consists of a comprehensive review of the relevant dividend policy theory and a brief inquiry of the efficient market hypothesis. Furthermore, the data sample is followed by a review of the event study and other methods used in this study. In addition, the results are combined with an analysis and discussion about the outcome. This is followed by a conclusion and a brief review of the delimitations of this paper.

2. Theory

2.1. Dividend Policy

2.1.1. Dividend Irrelevance Theory

Modigliani and Miller (1958) initiated the dividend irrelevance theorem and argued that an investor will be indifference between dividend policies. Although, the authors relies on multiple assumptions on perfect markets, such as no taxes and bankruptcy costs. The intuition behind this theorem is that if the dividend is too high for an investors preference, the investor will repurchase the stock for the dividend payout. Conversely, if the investor thinks the dividend is too small, the investor will sell a portion of the firm's stock to replicate the optimal dividend policy for the investor. Hence, an investor will be indifference between capital gain/dividend ratios since they could set their optimal dividend yield by repurchase and sell the specific stock.

2.1.2. Dividend Smoothing

The theory of dividend smoothening was first initiated over 50 years ago in a well-known study by Lintner (1956). For obvious reasons, a firm's earnings announcement will change from one year to another. Dividends, on the other hand, are adjusted relatively infrequently and are much less volatile than earnings. Firms also tend to increase their dividend more frequently than they cut them. The intuition behind these results is that a firm's management believes that investors prefer stable dividends with sustained growth and a desire from the company to maintain a long-term dividend payout ratio. Hence, a company's management tends to increase their dividend only when they expect a long-term sustainable growth in the future earnings and decrease them as a last resort.

In theory, a firm could change their dividends by adjusting the number of shares they repurchase and the amount of cash they retain. In practice, however, issuing new capital is associated with transaction costs and taxes and therefore a firm does not want to commit to a dividend they will not be able to afford with regular earnings. Hence, a company tends to set the dividend policy in line with future earnings prospects. (Berk and DeMarzo, 2014, p. 608-609)

2.1.3. "Bird in the hand" fallacy

As a counterpart to Modigliani and Miller's (1958) dividend irrelevance theorem, Gordon (1960) and Lintner (1962) initiated "bird in the hand" theorem and argued that investors will prefer dividends over a potential capital gain because dividends will give investors certain cash while a capital gain is more uncertain. The "Bird in the hand" fallacy is based on the adage "a

bird in the hand is more worth than two in the bush," implying that it is preferable to have one opportunity for sure rather than having two which is uncertain. The assumption behind this fallacy is that investors are risk-averse. Therefore, investors will demand a larger total return from firm's that have a higher capital gain/dividend ratio. If this theorem holds, it would implicitly mean that investors will increase the stock price in the case of positive dividend announcement and cut the stock price given a negative dividend announcement.

2.1.4. Dividend Signaling

The dividend signaling approach was first established by Ross (1977) and Bhattacharya (1979) as an attempt to explain why firm's pay dividend despite the tax disadvantage. In dividend signaling theory, every action a firm is taking is analyzed by the financial market to determine a firm's future cash flows and firm value. If companies' smooth dividends, a change in dividend will signal information to the financial market, whether or not that is the firm's intent. The financial market is in general skeptic about announcements by a firm, since an announcement could be easily imitated by other firms without good projects. Signaling theory suggest that a company should take actions that signal to the market that they have lucrative projects ahead. Actions which could not be imitated by a company with bad projects. One way to do so is by increasing the dividend. By increasing the dividend, the company will signal to the financial market that they have lucrative projects ahead and will be able to generate higher cash flows in the long term. (Damodaran, 2001, p. 680-681)

Therefore, a positive dividend announcement should make investors reevaluate the firm value and hence increase the stock price. Conversely, a negative dividend announcement should signal to the investors that the company has a hard time keeping up their cash flows, which should lead to decrease in stock price. (Damodaran, 2001, p. 680-681)

Damodaran (2001, p 681-682) further argue that for large companies, the dividend policy might not be the most efficient method to signal that the firm is undervalued due to substantial tax liability. A more cost-efficient way would be to let an equity analyst convey the business. Although, for small companies which have relatively few signals available, a change in dividend policy might be the most cost-efficient method.

Furthermore, there is a possibility that an increase in dividend might send a negative signal to the market. Imagine a firm which, has never paid dividends to the stockholder, and historically has had extraordinary growth and high return on their projects. If that company suddenly starts

to pay dividends, this might signal to the market that the projects ahead are not as lucrative as they used to be (Damodaran, 2001, p 681-682).

To conclude, if the dividend signaling theory holds one can expect that a positive (negative) dividend announcement will increase (decrease) the stock price and for the neutral announcement, there will be no defined pattern. Although, for the dividend announcement to have an impact on the stock price there must be an unexpected dividend announcement. If the signaling theory holds, an expected dividend announcement will not affect the stock price while an unexpected announcement will.

2.1.5. Alternative Dividend Theories

There exist more explanations than the dividend signaling approach in why some firms prefer to pay dividends rather than repurchase shares. Easterbrook (1984) argues that dividends are a tool to reduce agency cost, i.e. to diminish managerial discretion/power. The idea behind this theorem is that an explicit dividend policy, i.e. a commitment to pay dividends, forces managers to be disciplined in project choices. If this theorem holds, the dividend policy is used to prevent managers from making choices which are not beneficial for the stakeholders.

An other well-known dividend theorem within corporate finance research is the clientele effect. Allen et al. (2000) state that firms which pay dividends are more likely to attract institutional investors due to a tax advantage over private investors, which induces "dividend clientele" effects. Investors seem to invest in firm's which match their preference in dividend yield. Hence, stockholders who have high tax brackets and does not need the cash flow from dividend tend to invest in low-yield or non-dividend stocks. Conversely, investors/institutions which have low tax brackets and need the cash flow from dividend tend to invest in high-yield stocks.

2.2. Efficient Market Hypothesis

Fama (1970) states that an ideal market will give reliable signals for resource allocation. That implies that a firm can decide between production-investments and investors can choose between securities which represent ownership of a company with the assumptions that the price of the security at any time "fully reflects" all available information. The market is efficient if it reflects all available information at the time.

Sewell (2012) argues that the efficient market hypothesis (EMH), since the early 1970s, has been one of the most controversial and well-studied theories in all social sciences. The validity of the EMH is still debated between financial economists, despite improvements in quality and sample data, and progress within statistical analysis and theoretical models.

According to EMH, a market is efficient if the stock price adequately reflects all available information. The concept of EMH is that the more efficient the markets are, the more random is the sequences of price changes on the market. The most efficient market is when the market is totally unpredictable and follows a random walk. (Lo, 2007)

2.2.1. Weak-form Hypothesis

The weak-form of EMH implies that stock prices "fully reflects" all available information when it comes to market trading data such as historical prices, volume, and short interest. The market trading data is available and free of charge to anyone. Implying that if market trading data could give reliable information about future performance, this would already adequately reflect the stock price. The weak-form hypotheses intend that all technical analysis is purposeless. (Bodie, Kane and Marcus, 2011, p. 375-376) Fama (1970) states that the weak-form only tests if the information reflects historical data.

2.2.2. Semistrong-form Hypothesis

The semistrong-form of EMH intends that stock prices "fully reflect" all public information available. Furthermore, all information about a firm's products, quality of the management, balance sheet, patent and earnings forecasts are available to everyone. The semistrong-form considers all fundamental information that is accessible to the public. According to this form, all aspects of technical analysis is pointless but also most of the fundamental analysis. (Bodie et al., 2011, p. 376) Fama (1970) argues that the semistrong-form of EMH tests whether prices efficiently reflects the information available to the public.

2.2.3. Strong-form Hypothesis

The strong-form of EMH implies that all information "fully reflects" the stock price. That includes general information but also information which is only available for insiders within the firm. The strong-form of EMH is quite extreme and unrealistic. (Bodie et al., 2011, p 376) Fama (1970) argues that one should not expect this to be a realistic view of the real world, but rather a benchmark of which the weight of deviations from the market efficiently could be considered. Furthermore, this version tests whether investors or groups have monopoly access to information which is relevant for the pricing of the security.

2.2.4. Critics and implications of the EMH

Bodie et al. (2011, p. 384-385) discuss several factors why the EMH probably never will be widely accepted in the financial markets. One of these factors is the selection bias issue, implying that if a portfolio manager discovers a strategy which generates an abnormal return, it is unlikely that the manager will be willing to report this strategy to the world. Hence, only

the strategies that cannot make an abnormal return will be announced to the public. Therefore, one cannot honestly investigate the ability of portfolio manager to generate abnormal returns. Sewell (2012) argues that an important aspect to consider is that investors have various risk attitudes. That implies that investors will react differently when new information is announced on the market. This issue is important to consider when testing for the EMH.

To conclude, if the market applies a strong-form of EMH the signaling approach will be pointless since all the impact from the dividend announcement will already reflect the stock price. If the semistrong-form of EMH is prevailing, all the new information associated with the dividend change will immediately be reflected in the stock price when the dividend announcement is being released. For the weak-form of EMH, it is unclear whether the effect is occurring the same day of the announcement or if it takes multiple days to absorb the new information.

2.3. Previous studies

Aharony and Swary (1980) investigate the effect of the market share price to dividend announcement on the New York Stock Exchange. The authors use a sample of 149 industrial firms and divide these into three subsets, no change dividends, increase in dividends and decrease in dividends. Aharony and Swary (1980) further argues that a major difficulty in examining the effects of dividend announcement is that earning announcement and dividend announcement often are tightly synchronized. To distinguish between the effects, the subsets are divided into two categories, cases where earning announcement precede dividend announcement and cases where earning announcement follow dividend announcement. The authors conclude that firms which increase their dividend from the previous year had a positive abnormal return over the twenty days surrounding the dividend announcement day. Conversely, companies that cut their dividend from the last year had a negative abnormal return over the same period of days. For businesses that did not change their dividend, no abnormal return during the same window was found.

Capstaff et al. (2004) investigate the effect of the market share price to dividend announcement on the Oslo Stock Exchange. The authors argue that Norway with implications for agency cost and information asymmetry should increase the probability of for finding significant results, which the dividend signaling theory explains the market reaction to dividend announcement. Furthermore, they argue that corporate ownership structure in Norway is different from the U.S. and U.K. and that the motivation for using dividend as signaling method should be stronger.

The authors are using an event study to examine whether the results are different from positive-, neutral- and negative dividend announcement. Furthermore, the authors are using two different models; the naive model and the analyst model. The naive model is a basic approach where the authors investigate whether the dividend has changed from the previous year. The analyst model is a more realistic model, where Capstaff et al. examines the relation between the analysts' expectations of the dividend and the announced dividend. The authors identify significant abnormal return for the dividend announcement day, both for positive and negative announcements. The authors conclude that there tends to be no significant difference in the results between the naïve model and the analyst model.

Benartzi, Michaely, and Thaler (1997) examine whether the changes in dividends express the future or the past. The authors are skeptic about the impact of a change in dividends on a company's future earnings. In the sample, which includes 1 025 firms and 7 186 firm-year observations, the authors argue that companies which increase their dividend have significant earnings increase in years -1 and 0. Although, the authors find limited support that a dividend increase implicates unexpected earnings growth in the future. Furthermore, the size of the dividend increase tends to have no impact on the future earnings. Conversely, businesses that decreased their dividend experienced a reduction in earnings in years -1 and 0 but shows significant earnings increase in year 1. Even though the authors find no support that a dividend increase implies earning an increase in the upcoming year, firms that increase dividend has a positive excess return for the following three years. Benartzi et al. (1997) conclude that a dividend change is more likely to signal the past than the future.

Koch and Sun (2004) examines the relation between dividend changes and recent past earnings changes on the US market and the sample consists of 6 395 firm-year observations and 1 682 firms. They argue that stock price reaction to a dividend announcement is associated with prior earning news and find significant empirical evidence which supports their claim. For prior positive (negative) earnings announcements which are followed by increased (decreased) dividend change, the authors find a positive statistical reaction for the day of the dividend announcement. Conversely, if a dividend change contradicts prior earning announcements, i.e. if a firm from a negative prior earning announcement decides to increase the dividend, the market reaction is negative on the dividend announcement day. The authors conclude that investors tend to use a dividend change to evaluate the persistence of past earnings.

Bajaj and Vijh (1990) investigates the price reaction to dividend announcements on US market with a dividend clientele approach and the sample consist of 54 058 firm-year observations. The authors find empirical evidence that the price reaction to a dividend change will be more significant for high-yield stocks. The price reaction to an increase (decrease) in dividends are –0,63 % (-0,53 %) for low-yield stocks and 1,54 % (-2,57 %) for high-yield stocks in their results. Furthermore, they conclude that their findings make it difficult to investigate the information content of dividend announcements since the dividend yield significantly affects the short-term effect on the stock price.

3. Data

All firms in the sample are part of the large cap on the Stockholm Stock Exchange for the period 2014-2017. The data are drawn from Nasdaq OMX and respective firms' report for the fourth quarter (Q4). The analyst estimate was gathered from Financial Times (FT.com Markets Data). All data handling has been made in Microsoft Excel.

3.1. Industry Classification

Table 1. Sample Descriptive Characteristics

Industry classification	# of firms	% of firms
Basic Materials	4	6%
Consumer Goods	7	11%
Consumer Services	7	11%
Financials	23	35%
Health Care	2	3%
Industrials	18	28%
Technology	3	5%
Telecommunications	1	2%
Total	*65*	100%

Note: The table shows the number of firms in each industry classification and the weight in percent of the total sample. Finance includes all commercial banks, investment companies, and real estate firms. Industry sectors are based on the Financial Times Industry Classification.

Table 1 shows the industry classification amongst the firms in the sample. All firms are listed on the large cap, and the sample was used to give a good proxy for the overall Stockholm Stock Exchange. The requirement for a firm to be a part of the large cap is that the firm value is higher than one billion euro. This implicitly implies that these firms are more mature and therefore, in general, tends to distribute more of their cash flows in dividends.

Furthermore, the market capitalization of the large cap in relation to the total market value of the Stockholm Stock Exchange is approximately 91 %, and therefore should large firms in the sample give a relatively good estimate for the overall market. The fundamental data for market capitalization was gathered from Börsdata.

3.2. Requirements and sample size for different models

Table 2. Dividend Announcements

Panel A - Sample		# of announcements
Naive model		246
Analyst model		217
Interaction with Earning Announcements		199
Panel B - Dividend Annoucement per year		
Years	# of announcement	% of Total
2014	62	25,2%
2015	60	24,4%
2016	62	25,2%
2017	62	25,2%
Total	*246*	*100%*

Note: Panel A shows the sample size for the different models and interactions. Panel B shows the number and weights of the announcements per year.

There was no requirement that a firm should be traded for the entire period, to eliminate survival bias. Firm-year observations before 2014 have not been considered since equity analyst consensus does not extend over that period. Confounding events, i.e. share- and bond issues, have been removed from the sample to provide robust and reliable results. For obvious reasons, a firm need to have at least two firm-year observations to be able to compare between years. Furthermore, firms which are co-listed in several markets was also removed.

The equity analysts' consensus data for dividend- and earnings announcements lack data for some of the firms and therefore is the sample for reduced for the analyst model and the interaction with earning announcements. The overall sample consists of 65 firms and 246 firm-year observations and is further reduced for the analyst model and the interaction with earning announcements to 217 and 199 firm-year observations, respectively.

4. Method

4.1. Event study

To produce an event study, one has to define an event of interest. The interest of this paper is the dividend announcement date. For all the firm's in the sample, this is the same day as the press release of the report for the fourth quarter.

Bodie et al. (2011, p. 381) argue that an event study is a proper technique of empirical finance research if one wants to investigate the effect of a particular announcement on a firm's stock price. If the market absorbs all available information, this implies that price changes should reflect all new information. Brooks (2014) states that event studies are useful to test the efficient market hypothesis.

4.1.1. Event window

MacKinley (1997) indicates that it is beneficial to define the event window larger than the particular period of interest. It is common that the event window is expanded to multiple days, to capture the price effect of the announcement which for various reasons did not occur on the announcement day. It is a possibility that the information is available to the public before or after the time of the announcement and a too small event window could miss some of the potential impacts.

In this paper, several event window has been chosen, [-3 to -2], [-1 to +1] and [+2 to +3]. [-3] means three days before the day of dividend announcement, which has index 0. The first window [-3 to -2] capture the effect which occurs before the event has been announced. The second window [-1 to +1] is most likely to capture the largest reaction (if the new information is something that affects the value of the firm). The third window [+2 to +3] capture the efficiency in which the market absorb the new information.

In Appendix 2, a broader spectrum is presented which includes the average abnormal return (AAR) for each day in the period [-10 to +10] surrounding the announcement day. This is the same approach as Capstaff et al. (2004) using in their event study for similar data on the Oslo Stock Exchange.

4.1.2. Estimation window

Event studies primary focus is to capture the difference between actual return and the normal return (i.e. the return if no event occurred). (Ahern, 2009) For the estimation window, the most common choice is to use a period before the event window. To prevent the event from influencing the parameter estimates, one should not include the event window in the estimation window. (MacKinley, 1997) If the firm experience a fundamental change from the event, it is essential to use pre-event data to determine the normal return. Conversely, if the company experience unrealistic high returns in the pre-event data, it would be wise to use post-event data to estimate the normal return. (Ahern, 2009)

The normal return is usually estimated with appropriate market data before the event. (Brooks, 2014, p. 636) In this paper, the index OMXSPI has been used to estimate the normal return. OMXSPI (Stockholm all-share) weights the value of all the shares listed on the Stockholm Stock Exchange, thus showing an overall picture of the stock market development. This index is market-weighted, i.e. if a firm constitutes 20 % of the value of the Stockholm Stock Exchange, OMXSPI will be controlled for 20 % of that specific firm's returns. (Nasdaq OMX, 2017)

In this paper, an estimation window for the pre-event data in the period [-211 to -11] is being used. Similar studies such as Capstaff et al. (2004) have used a longer window of [-261 to -11], but to avoid that previous year's events occur in the estimation, this study has chosen to shorter the estimation window. According to MacKinley (1997) is the length of minor importance and suggest an even shorter estimation window of 120 days. Brooks (2014, p. 636) argues that longer estimation likely will provide more precise estimations of the normal return, but a too long estimation will increase the likelihood of a structural break, so there is a trade-off.

Furthermore, Brooks (2014, p. 636) suggest that it is beneficial to have a gap between the estimation window and the event periods. To be completely sure that the event does not affect the estimation window. This has been considered in the study, and a gap between [-11 to -3] has been used to prevent this problem.

4.1.3. The market model

To determine the normal return, this paper has chosen the market model, which assumes a stable linear relation between market return and stock return. (MacKinley, 1997) This approach is probably the most common model to construct expected returns. The market model creates

expected return using a regression of the return on the security and the return of the market index. The model is following:

$$E[R_{it}] = \alpha_i + \beta_i \times R_{mt} + u_{it} \quad (1)$$

where $E[R_{it}]$ is the expected return, α_i is the intercept, β_i is the slope, R_{mtt} is the return of the market and u_{it} is the error term. (Brooks, 2014, p. 637)

4.1.4. Abnormal return and cumulative abnormal return

The abnormal return is the actual return minus the forecasted/normal return for each security in the event window. The normal return is the return that would occur if the event did not take place. (MacKinley, 1997) The abnormal return is specified as:

$$AR_{it} = R_{it} - E[R_{it}] \quad (2)$$

where AR_{it} is the abnormal return, R_{it} is the actual return and $E[R_{it}]$ is the expected return.

The abnormal returns are further summarized for each of the three event windows to a cumulative abnormal return. The cumulative abnormal return is specified as:

$$C\hat{A}R_i\,(T_1, T_2) = \sum_{t=T_1}^{T_2} \hat{A}R_{it} \quad (3)$$

The average abnormal return for all firms can be specified as:

$$A\hat{A}R_t = \frac{1}{N}\sum_{i=1}^{N} \hat{A}R_{it} \quad (4)$$

The average abnormal return can further be used to calculate the cumulative average abnormal return. The formula is following:

$$C\hat{A}AR\,(T_1, T_2) = \frac{1}{N}\sum_{i=1}^{N} C\hat{A}R_i(T_1, T_2) \quad (5)$$

To define whether the cumulative abnormal return is significant one need to derive the variance. The variance of the abnormal return can be specified as:

$$\sigma^2(AR_{it}) = \frac{1}{T-2}\sum_{t=2}^{t} \hat{u}_{it}^2 \quad (6)$$

where $\sigma^2(AR_{it})$ is the variance, T is the number of days in the estimation period. For event window which includes several days, variance can be specified from following formula:

$$\sigma^2\left(CAR_i(T_{1,}T_2)\right) = (T_2 - T_1 + 1)\sigma^2\left(\widehat{AR}_{it}\right) \quad (7)$$

For the event windows [-3 to -2], [-1 to +1] and [+2 to +3], the t-test can be specified as:

$$SC\hat{A}R\,(T_1, T_2) = \frac{C\hat{A}R_i}{\left[\sigma^2\left(CAR_i(T_1,T_2)\right)\right]^{0,5}} \sim N(0,1) \quad (8)$$

(Brooks, 2014, p. 636-641)

4.1.5. Hypothesis test

The hypothesis test investigates whether the cumulative average abnormal return is different from zero, or not. The test is to review whether it can be shown that common stock prices have a significant abnormal return in the event windows [-3 to -2], [-1 to +1] and [+2 to 3] from a dividend announcement.

$$H_0: CAAR = 0$$

$$H_1: CAAR \neq 0$$

4.2 Dividend Expectation Models

In order to evaluate a firm's dividend announcement, one has to derive methods to test this new information. In this paper, two well-known models have been chosen, the naive model and the analyst model. A naive model is a simple approach which compares the previous year to another, and the analyst model investigates the difference between analysts' consensus of the dividend and the actual dividend.

4.2.1. The Analyst model

It is unrealistic that the naive model will capture all of the impacts of a dividend announcement since it is likely that investors are influenced by information that the company has announced during the year. An alternative method to the naive model is to investigate the difference between analysts' consensus of the dividend and the actual dividend. Dividend forecasts made by equity analysts should reflect all information that is available to the public at the time of the forecasts. (Capstaff et al, 2004) The formula is specified as:

$$E(D_{i,t}) = \overline{AF}_{i,t} \qquad (9)$$

where $E(D_{i,t})$ is the expected dividend per share for company i in year t and $\overline{AF}_{i,t}$ is the average of the equity analysts' consensus about the dividend per share for the company i in year t. (Capstaff et al, 2004)

The equity analysts' dividend forecasts were gathered from Financial Times (FT.com Markets Data). The sample data consists of 217 dividend announcements, and for the firm-year observation to be a part of the sample, at least four equity analysts have to cover the company. Furthermore, if the consensus is within one percent of the actual dividend, it is considered as neutral (otherwise only positive and negative announcements would be gathered).

4.2.2. The Alternative Naive model

To determine the reaction of share price to dividend announcement empirically, a method of unexpected change in dividends must be used. (Aharony and Swary, 1980) The naive model is a method in which one compare the dividend announcement from one period to another. The formula is specified as:

$$E(D_{i,t}) = D_{i,t-1} \tag{10}$$

where $E(D_{i,t})$ is the expected dividend for firm i in year t and $(D_{i,t})$ is the dividend per share for the firm in year $t-1$. (Capstaff et al, 2004)

Dividend announcements is considered positive if $D_{i,t} > E(D_{i,t})$, neutral if $D_{i,t} = E(D_{i,t})$ and negative if $D_{i,t} < E(D_{i,t})$. This model is derived from the dividend smoothing hypothesis, in which a firm's management do not change dividends unless the firm's management expects a sustainable change in future earnings for the company. For which an increase in dividends indicates a positive change for the manager's expectation about the firm's future prospects, and a cut in dividends signal a more pessimistic view. (Aharony and Swary, 1980)

The dividend announcement is by definition not an unknown event; the information content crucially depends on what the expected dividend are to further have an impact on the stock price. The analyst model is probably the most realistic approach to measuring the unexpected dividend change since analysts' consensus consists of information throughout the year while the naive model only measures the change from previous year. For both models, the CAAR is calculated for each portfolio, i.e. for positive-, neutral- and negative dividend announcements separately.

4.3. Critical review

4.3.1. Reliability

Bryman and Bell (2015, p. 169) states that reliability is a measurement of consistency, implying that the results should be stable over time, i.e. whether the paper can be implemented again with similar results. In this study, a period of four years, 2014-2017, has been chosen and since the state of the market is positive within these years, there is a possibility that a sample which includes a bear market could show a slightly different outcome. Although, it was not manageable for this study to include a bear market in the sample due to the lack of data for financial analysts' consensus. Nevertheless, the undersigned is confident that the results are relatively reliable since previous studies for other countries and different time periods has presented similar results. To ensure that the method chosen in this study is reliable, well-known papers from Ahern (2009), Brooks (2014) and MacKinley (1997) has been used as references.

4.3.2. Validity

Bryman and Bell (2015, p. 170) states that validity describes whether the method is relevant for the context in the paper. This study has chosen to use an event study, which is an established and proven method of financial research. The research question in this paper are closely related to the event study, implying a high validity and that the results show relevant outcomes. Previous studies, such as Capstaff et al. (2004) and Aharony and Swary (1980), has used the same method and theories.

4.3.3. Ethical Reflections

Ethical issues within social science are something that has been actualized recently, and this paper has taken these issues into consideration. Bryman and Bell (2015, p 129-142) states that a major issue is that there should be no pretense or withholding of essential information in a research paper. This paper has only investigated listed companies on the Stockholm Stock Exchange, and the information has been gathered from reliable sources, such as Nasdaq OMX, Financial Times (FT.com Markets Data) and interim reports from respectively firm in the sample. All the sources and fundamental data that have been used in this study is official information and available for everyone. Claims have been substantiated with references from research and industry, and these have not been removed from their context or have the overall meaning of these allegations are the same.

5. Results and Analysis

This section presents the results obtained from the data sample that has been proceeding using the methods described in the previous chapter.

5.1. The Analyst model

Figure 1. The distribution of the CAR for positive dividend announcements at the event window [-1 to +1].

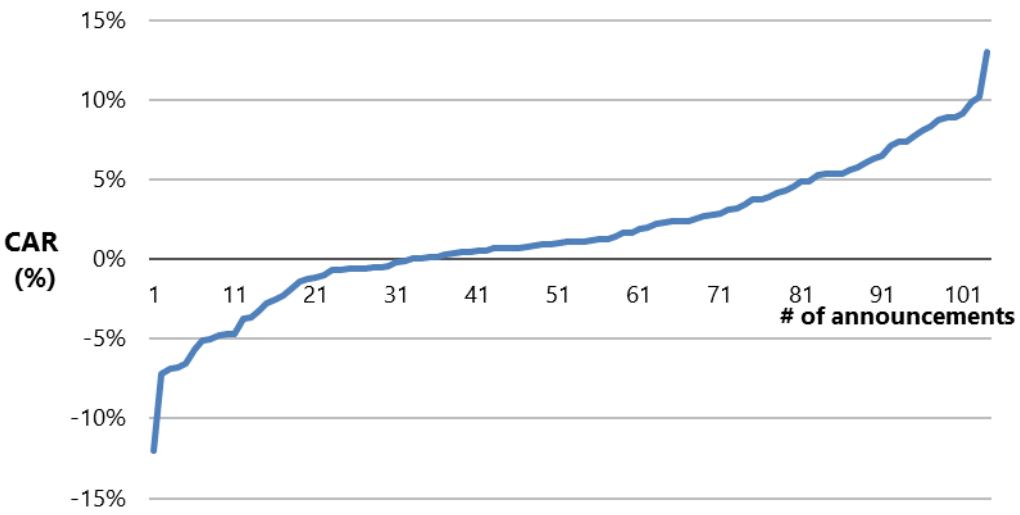


Figure 2. The distribution of the CAR for negative dividend announcements at the event window [-1 to +1].

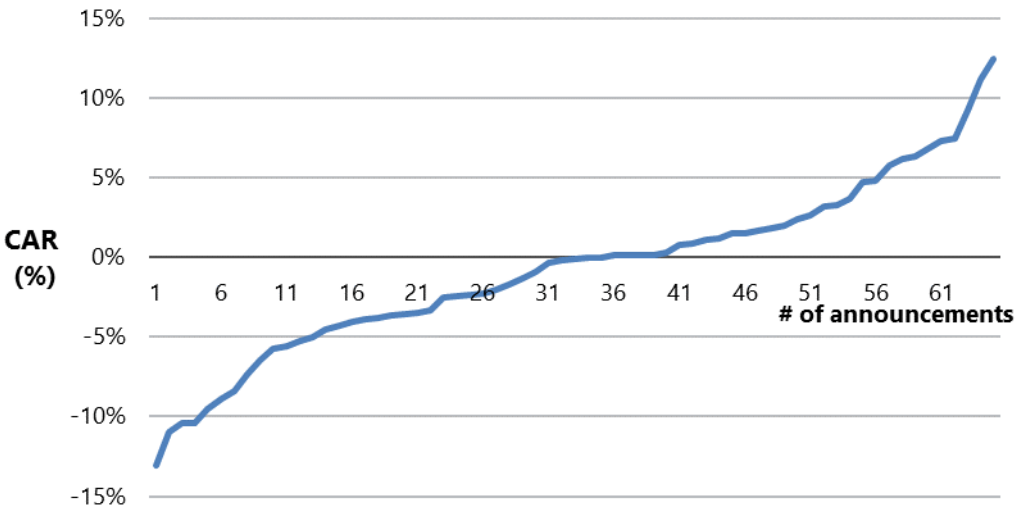
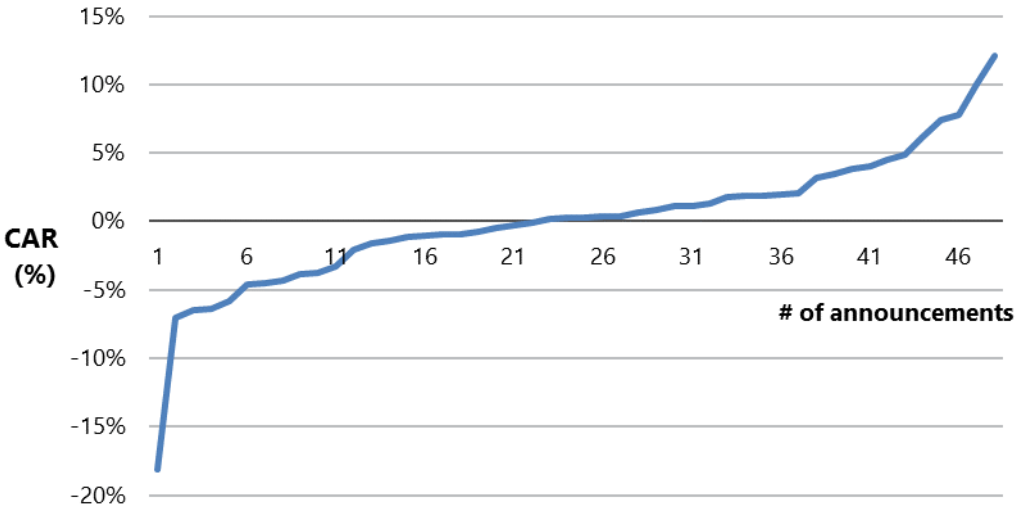


Figure 3. The distribution of the CAR for neutral dividend announcements at the event window [-1 to +1].



Note: The estimation window is [-211 to -11], and the estimation model is the market model. The index OMXSPI has been used as an approximation of the market return. The firm-year observations have been distributed based on their cumulative abnormal return.

In figure 1,2 and 3, all dividend announcements from the event window [+1 to -1] have been compiled in increasing order. This has been used to illustrate the distribution of all the CAR. The sample of positive-, negative- and neutral dividend announcements consists of 104, 65 and 48 firm-year observations, respectively. The CAR for positive dividend announcements is within the interval of -11,99 % to +12,99 %. For negative dividend announcements, the CAR is between -13,03 % to 12,46 %, and for neutral dividend announcements, the CAR is within the interval of -18,15 % to 12,13%. The distribution for the other dividend expectations model, the naive model, can be found in Appendix 1.

The illustration of the distribution for the different scenarios/portfolios is interesting. For positive dividend announcements, the distribution is skewed. The positive announcements consist of 72 positive reactions and 32 negative reactions. Hence, one can conclude that it is more likely that a firm, which announces a dividend increase higher than the financial analysts' consensus, has a positive price reaction in the event window [-1 to +1]. For neutral- and negative dividend announcements the pattern is not that obvious. For neutral announcements, a well-distributed sample was expected since the dividend changes are in line with the consensus. Although, for negative announcements the distribution presented in this paper was unexpected. One possible explanation could be derived from Bajaj and Vijh's (1990) findings

of the “dividend clientele” effect, where low-yield firm’s stock price reacts lower to dividend changes than high-yield firms. It is possible that a significant part of the firm-year observations that presented negative dividend announcements are low-yield firms. If this is the case, stockholders are less elastic to dividend changes and therefore do not distress to a dividend change as much as high-yield firm. Furthermore, it is possible that the sample for negative dividend announcements is too small to construct a reliable distribution, and hence the results might be misleading.

Table 3. The CAAR’s for positive-, neutral- and negative dividend announcements.

*, **, ***, **** refer to a statistical significance for respective, 10%, 5%, 1%, 0,1%.

Panel A: Positive Announcements

Event Window	CAAR	Positive;Negative	P-value
[-3 to -2]	-0,07%	54;50	0,71
[-1 to +1]	**1,54%**	**72;32**	**0,00 ******
[+2 to +3]	-0,28%	42;62	0,06 *

Panel B: Neutral Announcements

Event Window	CAAR	Positive;Negative	P-value
[-3 to -2]	-0,01%	25;23	0,97
[-1 to +1]	**0,09%**	**26;22**	**0,89**
[+2 to +3]	-0,02%	26;22	0,95

Panel B: Negative Announcements

Event Window	CAAR	Positive;Negative	P-value
[-3 to -2]	-0,10%	29;36	0,62
[-1 to +1]	**-0,73%**	**31;34**	**0,28**
[+2 to +3]	-0,04%	32;33	0,84

Note: The model used is the analyst model. Estimation window is [-211 to -11]. CAAR is the cumulative average abnormal return in the event window. The third column shows the actual number of positive versus negative returns in the event window. The p-value refers to whether the value is statistically significant.

This study finds significant positive CAAR of 1,54 % for the analyst model, where firm’s increase their dividend more than the analyst's consensus, in the event window [-1 to +1]. For this window, 72 out of 104 firm-specific observations showed a positive CAAR. For event window [-3 to -2] a slightly negative non-significant reaction of -0,07 % was observed. In event window [+2 to +3] a negative non-significant result of -0,28 % was found. For neutral dividend announcements, in which the dividend are at the same level as the analyst's consensus, this

paper finds a non-significant slightly positive CAAR of 0,09 % in the event window [-1 to +1]. For event window [-3 to -2] a slightly non-significant negative reaction of -0,06 % was found, and for event window [+2 to +3] a slightly negative reaction of -0,02 % was observed. For negative dividend announcements, where firm's cut their dividend in relation to the analyst's consensus, this study finds a non-significant CAAR of -0,73 % in the event window [-1 to +1]. For event window [-3 to-2] and [+2 to +3] the reactions were slightly non-significant negative of –0,10 % and -0,04 %, respectively.

In this paper, the results of the CAAR on the Stockholm Stock Exchange are consistent with similar studies on the Oslo Stock Exchange performed by Capstaff et al. (2004) and New York Stock Exchange examined by Aharony and Swary (1980). Both studies find a significant abnormal return for the dividend announcement day for both negative- and positive announcements. These studies have presented performance measures for ten days surrounding the dividend announcement day, and have chosen to investigate every day for this event window. This paper has instead used a CAAR for three event window, [-3 to -2], [-1 to +1] and [+2 to +3], to be certain that all the impact is included in the event. It is often the case that firms announce the interim reports at different times of the day. For the most of the companies, the announcement occurs before the openings of the market, although it is not the case for all firms in the sample.

Therefore, it is of considerable importance to compound several days in the event window to ensure that all of the impacts from the dividend announcement are included in the results. If one investigates every day surrounding the event as Capstaff et al. (2004) and Aharony and Swary (1980), it might be the case that the impacts of a dividend announcement are divided within several days in the results. Although both studies have presented a CAR for ten days surrounding the event, that might be a too extended period and include other impacts than the dividend announcement. MacKinley (1997) states that it is common and implicitly recommends compounding several days surrounding the particular event to ensure that all impacts are included in the results. An illustration of this issue could be seen in Appendix 2, Table 6, (same approach as Capstaff et al. (2004) and Aharony and Swary (1980)) where the AAR is significantly positive for the day -1 and +1 but not for the dividend announcement day. The CAAR for the same period, i.e. from the day -10 to +1, is not significant, which implies that a shorter period surrounding the event might be preferable.

Furthermore, the results for positive dividend announcements in Table 3 supports the dividend signaling theory by Ross (1977) and Bhattacharya (1979). The new information associated with a positive dividend announcement seems to be used as a signaling tool for firms to show the market that more lucrative projects are ahead. Although, for negative dividend announcements no significant results are supporting the signaling approach. The reason for this could be derived from Koch and Sun's (2004) findings that investors tend to use a dividend change to evaluate the persistence of past earnings. If a significant part of the sample already has announced negative earnings announcements in a preceding stage, a decrease in dividends will according to Koch and Sun (2004) be followed by a positive price reaction for the day of the dividend announcement. In other words, a negative dividend announcement could be seen as positive for investors if the previous earnings reports are negative as well.

The overall results seem to support the semistrong-form of EMH, where all the fundamental- and historical data is reflected in the share price. This is particularly the case for positive dividend announcements, where a significant price reaction was found for event window [-1 to +1]. Although, we cannot reject the weak-form of EMH since a slightly significant result was shown in the event window [+2 to +3], which might indicate that all of the impacts from the dividend announcement does not reflect the share price for event window [-1 to +1]. The strong-form can be rejected since a significant CAAR was found for positive dividend announcements.

5.1.1. Interaction with Earning Announcements

Table 5. The relation between dividend- and earning announcements.

*, **, ***, **** refer to a statistical significance for respective, 10%, 5%, 1%, 0,1%.

Panel A. Dividend annoucement and the related earnings announcement

Earning announcements	Dividend announcements			
	Positive	Neutral	Negative	Total
Positive	53 (54%)	21 (48%)	22 (39%)	96
Neutral	17 (17%)	5 (11%)	11 (19%)	33
Negative	28 (29%)	18 (41%)	24 (42%)	70
	98	44	57	199

Panel B. CAAR for event window [-1 to +1] and the p-value for each category.

Earning announcements	Dividend announcements		
	Positive	Neutral	Negative
Positive	2,21%	0,69%	1,60%
	(0,00)****	(0,61)	(0,21)
Neutral	0,94%	2,32%	-1,14%
	(0,25)	(0,33)	(0,16)
Negative	0,81%	-1,39%	-2,05%
	(0,37)	(0,07) *	(0,05) **

Note: CAAR is the cumulative average abnormal return. Parentheses in the panel show the weight of the total sample for respective category of dividend announcement and in panel B the p-value for each portfolio. The dividend- and earning announcement are gathered from Financial Times (FT.com Markets data).

In Table 5, the dividend- and earning announcements have been compounded into portfolios based on the sign of the CAAR in the event window [-1 to +1]. For a positive dividend- and earning announcement, the reaction is statistically significant for a CAAR of 2,21 %. The CAAR is positive for all of the positive dividend announcements, although the reaction is only significant where earnings announcements are positive as well. For neutral dividend announcements, there is no distinctive pattern. The CAAR is positive where earning announcements are either positive or neutral and negative when earning announcements are negative. For negative dividend announcements, the CAAR of -2,05 % is significant for negative dividend- and earning announcements.

The results from the interaction with earnings announcements are interesting. It seems to be the case that when earnings- and dividend announcements are positive (negative), the price reaction is statistically significant positive (negative) as well. Hence, it seems that one cannot reject the

hypothesis that a dividend change reflects the past, which is consistent with findings from Benartzi et al. (1997). The intuition behind this reasoning is that earnings to a large extent present the past, and even though a firm signals a dividend change to the market, it is not enough to affect the firm value. Although one should keep in mind that the reverse is true as well, i.e. an earnings announcement over the analysts' consensus alone is not enough for the firm value to be affected. In other words, for the firm value/stock price to be increased (decreased) it is necessary that both earnings- and dividend announcements are positive (negative).

5.2. Robustness tests

To further investigate whether the results are robust and reliable, this study has been used two different dividend expectation models. The results for the first one, the analyst model, has been shown in the previously section. The results for the second one, the naive model, are being shown below, together with a year by year analysis.

5.2.1. The Alternative Naive model

Table 5. The CAAR's for positive-, neutral- and negative dividend announcements.

Panel A: Positive Announcements

Event Window	CAAR	Positive;Negative	P-value
[-3 to -2]	0,02%	97;95	0,86
[-1 to +1]	**0,69%**	**115;77**	**0,05 ****
[+2 to +3]	-0,14%	89;103	0,28

Panel B: Neutral Announcements

Event Window	CAAR	Positive;Negative	P-value
[-3 to -2]	-0,06%	22;19	0,83
[-1 to +1]	**1,00%**	**24;17**	**0,21**
[+2 to +3]	0,21%	22;19	0,50

Panel B: Negative Announcements

Event Window	CAAR	Positive;Negative	P-value
[-3 to -2]	-1,67%	5;9	0,16
[-1 to +1]	**-1,53%**	**6;8**	**0,50**
[+2 to +3]	-0,98%	5;9	0,26

*, **, ***, **** refer to a statistical significance for respective, 10%, 5%, 1%, 0,1%.

Note: The model used is the naive model. Estimation window is [-211 to -11]. CAAR is the cumulative average abnormal return in the event window. The third column shows the actual number of positive versus negative returns in the event window. The p-value refers to whether the value is statistically significant.

This study finds significant positive CAAR of 0,69 % for the naive model, where firm's increase their dividend in relation to the previous year, in the event window [-1 to +1]. For this window, 115 out of 192 firm-specific observations showed a positive CAAR. For event window [-3 to -2] a slightly positive non-significant reaction of 0,02 % was observed. In event window [+2 to +3] a negative non-significant result of -0,14 % was observed. For neutral dividend announcements, in which the dividend are at the same level as the previous year, this paper finds a non-significant CAAR of 1,00 % in the event window [-1 to +1]. For event window [-3 to -2] a slightly non-significant negative reaction of -0,06 % was found, and for event window [+2 to +3] a positive reaction of 0,21 % was observed. For negative dividend announcements, where firm's cut their dividend in relation to a previous year, this study finds a non-significant CAAR of -1,53 % in the event window [-1 to +1]. For event window [-3 to -2] and [+2 to +3] the reactions were non-significant negative of -1,67 % and -0,98 %, respectively.

5.2.2. Year by year analysis

Table 4. Year by year analysis for the naive model.

Panel A. Dividend announcement by year

Years	Positive	Neutral	Negative	Total
2014	42 (69%)	17 (28%)	2 (3%)	61
2015	49 (82%)	8 (13%)	3 (5%)	60
2016	48 (76%)	10 (16%)	5 (8%)	63
2017	52 (84%)	6 (10%)	4 (6%)	62
All years	191	41	14	246

Panel B. CAAR's on announcement date

Years 2014-2015	Positive	Neutral	Negative
N	91	25	5
CAAR	0,56%	1,12%	-0,69%
	(0,21)	(0,32)	(0,83)
Years 2016-2017			
N	100	16	9
CAAR	0,83%	-0,15%	-2,16%
	(0,12)	(0,92)	(0,47)

*, **, ***, **** refer to a statistical significance for respective, 10%, 5%, 1%, 0,1%.

Note: Panel A shows the number and weights of positive-, neutral- and negative dividend announcements for every year of the sample. Panel A shows the cumulative average abnormal return (CAAR) and p-values for years 2014-2015 and 2016-2017.

The table above illustrates the data sample for the naive model year by year. The total sample is relatively well-weighted amongst the years 2014-2017, with an interval between 60-63 firm-year observations. The weights of positive-, neutral- and negative dividend announcements are also well-distributed amongst the years. The number of positive-, neutral- and negative dividend announcements are within the interval 42-52, 6-17 and 2-5 firm-years observations respectively.

Panel B shows CAAR for two sub-categories, years 2014-2015 and 2016-2017, and this paper finds a positive CAAR of 0,56 % for years 2014-2015 and 0,83 % for years 2016-2017 for positive dividend announcements. There was no defined pattern for neutral dividend announcements, where CAAR was 1,12 % for years 2014-2015 and -0,15 % for years 2016-2017. For negative dividend announcements, the CAAR was -0,69 % for years 2014-2015 and -2,16 % for years 2016-2017. Although, the results are not significant for any of the sub-categories.

This study finds no significant difference between the naive mode and the analyst model. The results from both of the dividend expectation models show a significant reaction to positive dividend announcements. For negative- and neutral announcements there are non-significant results. Although, for both of the models the CAAR is clearly negative for negative dividend announcements, but nevertheless we cannot draw any reliable conclusion from these findings. To summarize, the results from the naive model and the year by year analysis together with the interaction from earning announcements strengthen the robustness of the total outcome in this study.

6. Conclusions

This study examines the dividend announcement effect on the common stock price by a signaling hypothesis approach on the Stockholm Stock Exchange. The results presented are in line with previous studies examined on New York Stock Exchange and Oslo Stock Exchange. This study finds no significant difference between the naive mode and the analyst model, and analysis of the confounding effect between the earning- and dividend announcements strengthen robustness for the results. Hence, the undersigned is confident that the results are robust and reliable.

Furthermore, the overall results tend to support the signaling theory that a change in dividends will convey information to the market. This is particularly the case for positive dividend announcements, where a significant positive price reaction was shown for both of the dividend expectations models. No significant reaction was seen for negative dividend announcements, although the CAAR's are all negative for both of the models. For neutral dividend announcements, there was no significant pattern for the CAAR's in the event window.

Although this paper cannot reject that a dividend change reflects the past, since for the dividend change to have an impact on the share price, it seems like the dividend- and earning announcement has to have the same sign, i.e. either both positive or both negative. For a portfolio of positive (negative) earning- and dividend announcements is the CAAR, 2,21 % (-2,05 %).

As a consequence of the event study, it is possible to investigate the efficient market hypothesis. In this study, no significant reaction in the event windows [-3 to -2] and [+2 to +3] was found. Hence, it seems like dividend announcements support the semistrong-form of efficient market hypothesis, where all fundamental- and historical data reflects the stock price. The strong-form can be rejected since a significant CAAR was found for positive dividend announcements.

This study has focused on the short-term reaction to dividend announcements effects on the stock price. For those who are interested in deepening the understanding of the research about dividend policy's impact for the firm, I would suggest investigating whether a dividend change reflects the future prospects of earnings in the long-term. Another approach would be to examine whether the size-effect of a dividend change are in relation to the change in stock price.

7. Delimitations

Even though this paper has tried to prevent clustering effects by removing confounding event, it is still possible that this effect is not entirely removed. From previous research, we know that a stock price reaction for a firm from a certain announcement might affect firms within the same industry as well. This issue could have a minor impact when assessing the CAAR in the event study. Furthermore, the index used as a proxy for the market return, OMXSPI, might have flaws when comparing against the data sample used in this study. Although it is a good approximation of the total market in Sweden, it might be overestimating/underestimating the abnormal return for Large Cap firms on Stockholm Stock Exchange.

This paper has only considered the period 2014-2017, which might be a too short time horizon to examine. In general, it is recommended to include a full economic cycle in the sample for a research paper. Although, this was not possible because of the lack of data for equity analyst consensus before 2014. Nevertheless, this issue could have an impact on the overall results of this study.

The most difficult issue in this paper is the fact that firms, in general, announce their dividend in connection with the interim report for the fourth quarter. It is unrealistic to assume that all of the impacts could be explained be the dividend announcement in the interim report. Although, to reduce the flaws of this issue this study has conducted portfolios derived from whether the earning- and dividend announcement is positive, negative or neutral. Hence, other information in the interim report which could have an impact on the abnormal return, such as a change in management, order bookings, and product innovation, has not been considered in this paper.

9. References:

[1] Aharony, Joseph; and Swary, Itzhak; (1980). Quarterly Dividends and Earning Announcements and Stockholders return; An Empirical Analysis. *Journal of Finance.* Vol. 35: No. 1.

[2] Ahern, R. Kenneth; (2009). Sample Selection and Event Study Estimation. *Journal of Empirical Finance.* Vol. 16, No. 3.

[3] Allen, Franklin; Bernardo, E. Antonio; and Welch, Ivo; (2000). A Theory of Dividends Based on Tax Clienteles. *Journal of Finance.* Vol. 55, No. 6.

[4] Bajaj, Mukesh; and Vijh, M. Anand; (1990). Dividend clienteles and the information content of dividend changes. *Journal of Financial Economics.* Vol. 26: No. 2.

[5] Benartzi, Shlomo; Michaely, Roni; and Thaler, Richard; (1997). Do Changes in Dividends Signal the Future or the Past? *Journal of Finance.* Vol. 52: 1007-1034.

[6] Berk, Jonathan; and DeMarzo, Peter; (2014). Corporate Finance. 3rd Edition. *Pearson Education*.

[7] Bhattacharya, Sudipto; (1979). Imperfect Information, Dividend Policy and "The Bird in the Hand" Fallacy. *Bell Journal of Economics*. Vol. 10, No. 1.

[8] Bodi, Zvi; Kane, Alex; and Marcus, K. Alan; (2011). Investments and Portfolio Management. 9th Edition. *McGraw-Hill Press.*

[9] Brooks, Chris; (2014). Introductory Econometrics for Finance. 3rd Edition. *Cambridge University Press*.

[10] Bryman, Alan; and Bell, Emma; (2015). Business Research Methods. 4th Edition. *Oxford University Press.*

[11] Capstaff, John; Klaeboe, Audun; and Marshall P. Andrew; (2004). Share Price Reaction to Dividend Announcements: Empirical Evidence on the Signaling Model from the Oslo Stock Exchange. *Journal of Multinational Finance.* Vol. 8: 115-139.

[12] Damodaran, Aswath; (2001). Corporate Finance: theory and practice. 2nd Edition. *Wiley series in finance*.

[13] Easterbrook, H. Frank; (1984). Two Agency-Cost Explanations of Dividends. *The American Economic Review.* Vol. 74: No. 4.

[14] Elfakhani, Said; (1995). An Empirical Examination of the Information Content of Balance Sheet and Dividend Announcements: A Signaling Approach. *Journal of Financial and Strategic Decisions.* Vol 8, No. 2.

[15] Fama, Eugene; (1970). Efficient Capital Markets; A Review of Theory and Empirical Work. *Journal of Finance.* Vol. 25: 383-417.

[16] Fama, Eugene; (1965). The Behavior of Stock-Market Prices. *Journal of Business.* Vol. 38: 34-105.

[17] Gordon, J. Myron; (1960). Security and a Financial Theory of Investment. *The Quarterly Journal of Economics.* Vol. 74: No. 3.

[18] Koch, S. Adam; and Sun, X. Amy; (2004). Dividend Changes and the Persistence of past Earning Changes. *Journal of Finance*. Vol. 59: No 5.

[19] Lintner, John; (1956). Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes. *The American Economic Review.* Vol. 46: No. 2.

[20] Lintner, John; (1962]. Dividends, Earnings, Leverage, Stock Prices and the Supply of Capital to Corporations. *The review of Economics and Statistics.* Vol 44: No.3.

[21] Lo, W. Andrew; (2007). Efficient Market Hypothesis. *The New Palgrave: A dictionary of economics.* 2nd Edition. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=991509 (Retrieved 2017-05-08)

[22] MacKinlay, A. Craig; (1997). Event Studies in Economics and Finance. *Journal of Economic Literature.* Vol. 35: 13-39.

[23] Modigliani, Franco; and Merton, H. Miller; (1958). The Cost of Capital, Corporation Finance and Theory of Investment. *American Economic Review*. Vol. 49: 97-261.

[24] Modigliani, Franco; and Merton, H. Miller; (1961). Dividend Policy, Growth and the Valuation of Shares. *Journal of Business*. Vol. 34: 411-433.

[25] Nasdaq OMX (2017). Vad är aktieindex? http://www.nasdaqomxnordic.com/utbildning/aktier/vadaraktieindex?languageId=3 (Retrieved 2017-05-10)

[26] Ross, A. Stephen; (1977). The Determination of Financial Structure: The Incentive Signaling Approach. *Bell Journal of Economics.* Vol 8, p. 23-40.

[27] Sewell, Martin; (2012). The Efficient Market Hypothesis: Empirical Evidence. *International Journal of Statistics and Probability.* Vol. 1: No 2.

Appendix 1.

Figure 4. The distribution of the CAR for positive dividend announcements at the event window [-1, +1] for the naive model.

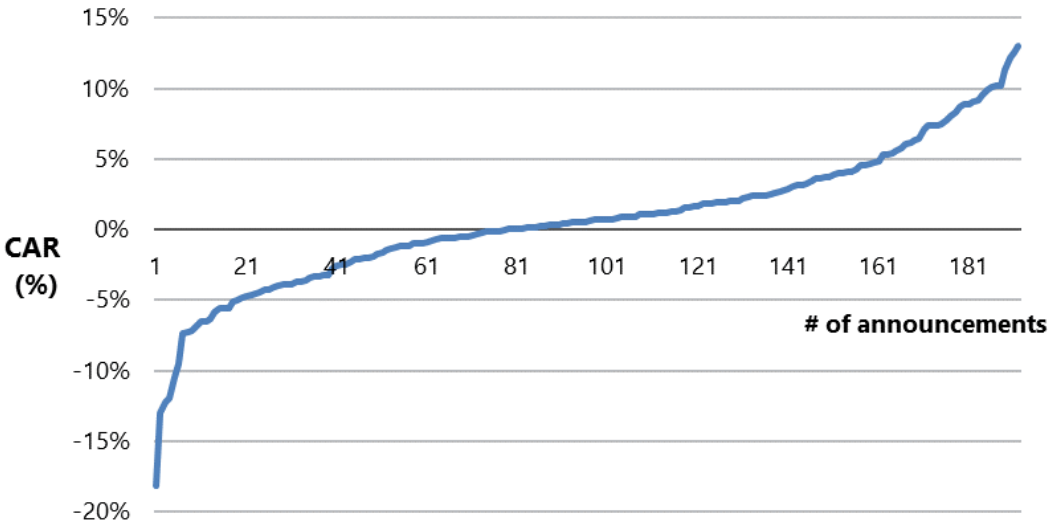


Figure 5. The distribution of the CAR for negative dividend announcements at the event window [-1 to +1] for the naive model.

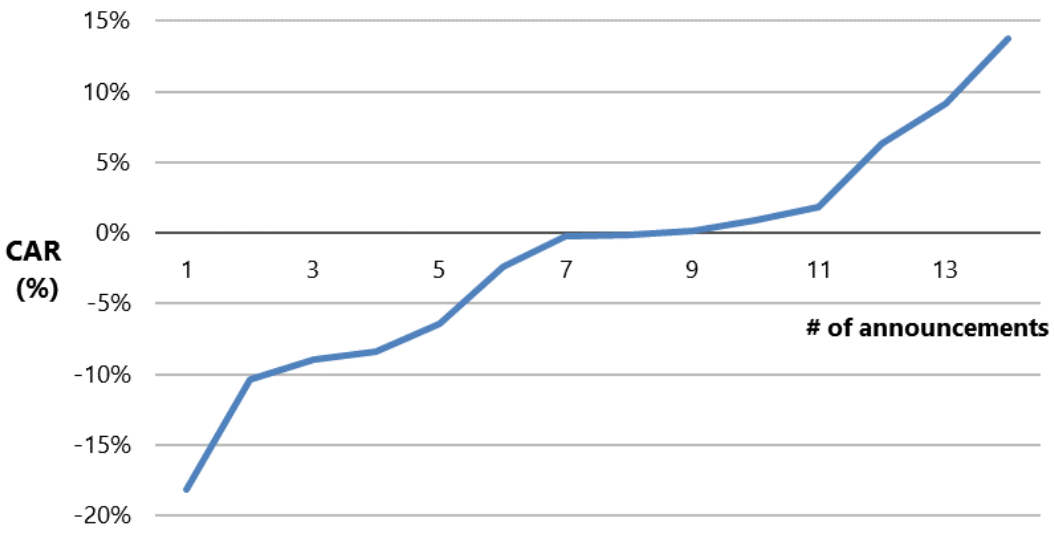
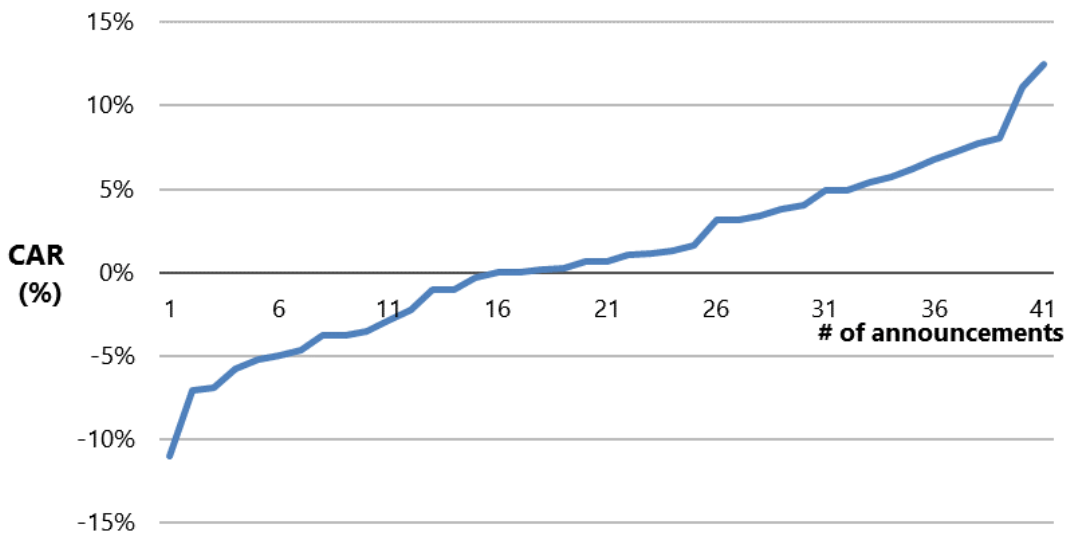


Figure 6. The distribution of the CAR for neutral dividend announcements at the event window [-1 to +1] for the naive model.



Note: The estimation window is [-211 to -11], and the estimation model is the market model. The index OMXSPI has been used as an approximation of the market return. The firm-year observations have been distributed based on their cumulative abnormal return.

Appendix 2.

The Naive Model. Average abnormal return (AAR) and cumulative average abnormal return (CAAR) for 10 days surrounding the dividend announcement day. This is the same approach as Capstaff et al. (2004) are using.

Table 6. Positive Dividend Announcements

t	AAR	P-value	CAAR	P-value
-10	0,03%	0,72	0,03%	0,72
-9	0,01%	0,93	0,04%	0,74
-8	0,08%	0,39	0,12%	0,46
-7	0,00%	0,97	0,12%	0,48
-6	0,01%	0,86	0,14%	0,46
-5	0,00%	1,00	0,14%	0,55
-4	-0,10%	0,31	0,04%	0,89
-3	0,02%	0,83	0,06%	0,83
-2	0,00%	0,98	0,06%	0,86
-1	0,31%	0,00 ****	0,37%	0,20
0	**0,01%**	**0,97**	**0,38%**	**0,70**
1	0,37%	0,01 ***	0,75%	0,13
2	-0,06%	0,53	0,68%	0,06 *
3	-0,08%	0,50	0,61%	0,16
4	0,12%	0,16	0,73%	0,03 **
5	-0,08%	0,32	0,64%	0,06 *
6	0,05%	0,48	0,69%	0,02 *
7	0,02%	0,94	0,71%	0,46
8	-0,14%	0,14	0,57%	0,16
9	0,02%	0,76	0,59%	0,07 *
10	-0,07%	0,33	0,52%	0,12

Table 7. Negative Dividend Announcements

t	AAR	P-value	CAAR	P-value
-10	0,06%	0,94	0,06%	0,94
-9	-0,47%	0,25	-0,41%	0,48
-8	0,10%	0,76	-0,32%	0,56
-7	0,21%	0,68	-0,11%	0,92
-6	-0,47%	0,07 *	-0,57%	0,31
-5	-0,15%	0,82	-0,73%	0,66
-4	-0,14%	0,68	-0,87%	0,34
-3	-0,86%	0,00 ***	-1,73%	0,04 **
-2	-0,70%	0,01 ***	-2,43%	0,00 ***
-1	-0,22%	0,59	-2,65%	0,04 **
0	**-0,37%**	**0,81**	**-3,02%**	**0,55**
1	-0,94%	0,25	-3,96%	0,16
2	-0,24%	0,58	-4,20%	0,01 ***
3	-0,74%	0,00 ***	-4,94%	0,00 ****
4	-0,19%	0,54	-5,12%	0,00 ****
5	-0,68%	0,45	-5,80%	0,11
6	-0,48%	0,18	-6,29%	0,00 ****
7	-0,17%	0,61	-6,45%	0,00 ****
8	-0,48%	0,25	-6,93%	0,00 ****
9	0,12%	0,80	-6,81%	0,00 ***
10	0,14%	0,77	-6,67%	0,00 ***

Table 8. Neutral Dividend Announcements

t	AAR	P-value	CAAR	P-value
-10	-0,15%	0,53	-0,15%	0,53
-9	0,03%	0,89	-0,12%	0,70
-8	0,25%	0,29	0,13%	0,75
-7	0,17%	0,50	0,30%	0,55
-6	-0,06%	0,78	0,23%	0,66
-5	-0,17%	0,52	0,06%	0,93
-4	-0,10%	0,74	-0,04%	0,96
-3	0,16%	0,48	0,12%	0,85
-2	-0,21%	0,35	-0,09%	0,89
-1	0,01%	0,96	-0,08%	0,92
0	**0,85%**	**0,38**	**0,77%**	**0,81**
1	0,14%	0,72	0,91%	0,49
2	-0,02%	0,94	0,88%	0,45
3	0,23%	0,25	1,12%	0,14
4	0,09%	0,61	1,20%	0,08 *
5	0,04%	0,85	1,25%	0,16
6	0,08%	0,78	1,32%	0,25
7	-0,01%	0,92	1,31%	0,04 **
8	0,07%	0,64	1,38%	0,05 **
9	0,09%	0,70	1,47%	0,16
10	0,13%	0,44	1,60%	0,04 **

The Analyst Model. Average abnormal return (AAR) and cumulative average abnormal return (CAAR) for 10 days surrounding the dividend announcement day. This is the same approach as Capstaff et al. (2004) are using.

Table 9. Positive Dividend Announcements

t	AAR	P-value	CAAR	P-value
-10	0,02%	0,91	0,02%	0,91
-9	0,17%	0,36	0,18%	0,47
-8	0,07%	0,74	0,25%	0,47
-7	0,39%	0,01 ***	0,64%	0,03 **
-6	0,09%	0,58	0,73%	0,04 **
-5	0,18%	0,35	0,90%	0,05 *
-4	0,17%	0,32	1,07%	0,02 **
-3	0,25%	0,27	1,33%	0,04 **
-2	-0,23%	0,18	1,10%	0,03 **
-1	0,01%	0,90	1,11%	0,00 ***
0	**0,68%**	**0,22**	**1,79%**	**0,33**
1	-0,05%	0,84	1,74%	0,04 **
2	-0,03%	0,86	1,72%	0,00 ***
3	-0,02%	0,92	1,70%	0,01 ***
4	0,13%	0,34	1,83%	0,00 ****
5	-0,05%	0,79	1,79%	0,01 **
6	-0,13%	0,34	1,66%	0,00 ***
7	0,23%	0,10 *	1,88%	0,00 ***
8	-0,26%	0,05 **	1,62%	0,01 ***
9	0,06%	0,60	1,67%	0,00 ****
10	0,23%	0,06 *	1,90%	0,00 ****

Table 10. Negative Dividend Announcements

t	AAR	P-value	CAAR	P-value
-10	-0,18%	0,56	-0,18%	0,56
-9	-0,04%	0,81	-0,22%	0,38
-8	0,20%	0,40	-0,02%	0,97
-7	0,12%	0,57	0,10%	0,81
-6	-0,32%	0,10 *	-0,22%	0,61
-5	0,03%	0,91	-0,19%	0,75
-4	-0,06%	0,72	-0,25%	0,58
-3	0,11%	0,51	-0,14%	0,78
-2	-0,11%	0,50	-0,25%	0,62
-1	0,21%	0,27	-0,04%	0,95
0	**-0,96%**	**0,28**	**-1,00%**	**0,73**
1	0,42%	0,15	-0,59%	0,56
2	0,20%	0,37	-0,38%	0,64
3	0,09%	0,48	-0,29%	0,56
4	0,21%	0,13	-0,07%	0,89
5	-0,25%	0,38	-0,32%	0,78
6	-0,03%	0,87	-0,35%	0,63
7	-0,13%	0,48	-0,48%	0,53
8	0,14%	0,49	-0,34%	0,70
9	0,17%	0,43	-0,17%	0,86
10	-0,06%	0,75	-0,23%	0,79

Table 11. Neutral Dividend Announcements

t	AAR	P-value	CAAR	P-value
-10	0,08%	0,93	0,08%	0,93
-9	-0,15%	0,73	-0,07%	0,91
-8	0,35%	0,24	0,28%	0,58
-7	-0,14%	0,52	0,14%	0,74
-6	0,46%	0,05 *	0,60%	0,26
-5	-0,38%	0,05 **	0,23%	0,63
-4	-0,41%	0,15	-0,18%	0,81
-3	-0,11%	0,47	-0,29%	0,50
-2	0,08%	0,71	-0,21%	0,74
-1	0,15%	0,59	-0,07%	0,94
0	**-0,14%**	**0,35**	**-0,21%**	**0,68**
1	-0,17%	0,26	-0,38%	0,46
2	-0,28%	0,16	-0,66%	0,36
3	-0,06%	0,76	-0,72%	0,30
4	-0,17%	0,37	-0,89%	0,22
5	0,25%	0,22	-0,64%	0,44
6	0,29%	0,06 *	-0,35%	0,58
7	0,21%	0,32	-0,14%	0,87
8	0,22%	0,13	0,07%	0,90
9	0,21%	0,30	0,28%	0,75
10	-0,09%	0,65	0,19%	0,84