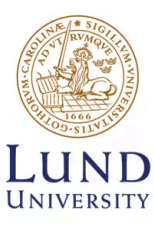

SCHOOL OF ECONOMICS AND MANAGEMENT

Department of Business Administration

FEKH89, Bachelor Thesis in Corporate Finance

Spring 2024

Market Reactions to Dividend Announcements:

Evidence from the Swedish Stock Market

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Sammanfattning

Titel: Market Reactions to Dividend Announcements: Evidence from the Swedish Stock Market

Seminariedatum: 31 Maj 2024

Kurs: FEKH89, Examensarbete Kandidatnivå i Finansiering, 15 Högskolepoäng

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Nyckelord: Annonserad Utdelning, Förändrad utdelning, Konsensusestimat, Kumulativ Abnormal Avkastning, Marknadsreaktion

Syfte: Denna studie ämnar att analysera hur förändringar i utdelning och dess differens gentemot konsensusestimat påverkar kumulativ abnormal avkastning på kort sikt.

Metod: För att undersöka studiens syfte så formulerades två hypoteser, vilka besvaras genom de olika eventfönster som OLS-regressionen analyserar.

Teoretiskt Perspektiv: Studien baseras på tidigare forskning inom ämnet och teoretiska ramverk som den effektiva marknadshypotesen, dividend irrelevance teorin och signaleringsteorin. Studiens slutliga urval består av de 39 största börsnoterade bolagen på den svenska aktiemarknaden, med konsensusestimat och utdelningsförändringar som är täckta på ett adekvat sätt.

Resultat: Resultaten visar att förändringar av utdelningar har en signifikant påverkan på den kumulativa abnormala avkastningen i alla händelsefönster, medan avvikelserna mellan annonserade utdelningar och konsensusestimat inte visar någon betydande effekt.

Slutsats: Studien visade att endast förändringar i utdelningen har en signifikant inverkan på aktiekurserna efter annonserad utdelning. Detta belyser svårigheterna med att isolera marknadens förväntningar på utdelningar och hur de påverkar aktiekurserna.

Abstract

Title: Market Reactions to Dividend Announcements: Evidence from the Swedish Stock Market

Seminar Date: 31 May 2024

Course: FEKH89, Degree Project Undergraduate level, Business Administration, 15 ECTS

Authors: Suprit Chowdary**,** Edgar Fahlström Nygren, Jacob Rothstein

Advisor: Anamaria Cociorva

Keywords: Dividend Announcements, Dividend Changes, Consensus Estimates, Cumulative Abnormal Returns, Market Reactions

Research question: How do dividend changes and the discrepancies between announced dividends and consensus estimates impact stock prices for Swedish companies following the dividend announcements?

Purpose: This study aims to analyze how dividend changes and the discrepancies between announced dividends and consensus estimates affect the cumulative abnormal return on the Swedish stock market

Methodology: To examine the study's purpose, two hypotheses are formulated, which are examined within each scenario of each event window through OLS regression analyses.

Theoretical perspective: The study is based on prior research within the subject and theoretical frameworks such as the efficient market hypothesis, dividend irrelevance theory, and signaling theory. The studied sample consists of the 39 largest publicly listed companies on the Swedish stock market, which have adequately covered consensus estimates and dividend changes.

Results: The results reveal that dividend changes consistently have a significant impact on cumulative abnormal returns across all event windows, while the discrepancies between announced dividends and consensus estimates do not show a significant effect.

Conclusion: The findings concluded that only dividend changes significantly impact stock prices following dividend announcements. Highlighting the difficulties of isolating the market's expectations about dividend announcements and how they impact stock prices.

Acknowledgements

Writing this thesis has provided us with valuable insights into the chosen subject, inspiring us to pursue further studies in corporate finance. We express our gratitude to Anamaria Cociorva for her advisory assistance and to Maria Gårdängen for her final insights, which helped complete this study.

Suprit Chowdary

Lund, 2024-05-26

Edgar Fahlström Nygren

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Lund, 2024-05-26

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1. Introduction

This chapter outlines the background and significance of the subject, introducing the conflicting theories surrounding it and specifying the target audience. Additionally, it defines the research question, purpose, and delimitations of the study.

1.1 Background

A dividend is a reward distributed by a company to its shareholders. It is typically derived from the company's free cash flow after allocations for reinvestment in its operations. The company's board of directors decides upon these distributions at the annual shareholder meeting. Whether a dividend is paid out and to what amount largely depends on the company's profitability, capital expenditure requirements, and other financial needs.

Dividend changes and announcements are among the factors that can affect stock prices, along with a multitude of other factors, such as economic indicators and the general expectations of the market. When a company announces a dividend that exceeds the market's expectations, more investors are inclined to buy into the stock, signaling a stable financial performance and a positive future outlook (Dasilas & Leventis, 2011). On the other hand, overestimated market expectations may signal possible financial trouble and future uncertainty, causing investors to adjust their opinion of the company's value downward, directly correlating with a declining stock price (Grossman & Stiglitz, 1980).

To estimate the collective judgments of financial analysts about the future outlook of companies, announced dividends are compared to consensus estimates derived from analyst forecasts. These estimates cover earnings, revenue, and dividend payouts, providing investors with a benchmark for company performance and significantly influencing the market's expectations (Healy & Palepu, 2001). Additionally, investors and analysts examine changes in dividend announcements. Yearly dividend increases can signal a positive future outlook and stable financial performance for a company, attracting more investors. Decreases in the announced dividends may instead signal financial trouble and future uncertainty, potentially resulting in negative market reactions. These dividend changes provide a greater context for assessing the significance of dividend announcements and how they align with the market's expectations.

Analysts' forecasts, portrayed in consensus estimates, help reduce information asymmetry, which arises through disparities between publicly available information and the comprehensive knowledge about a company and its future outlook. This information gap can result in investors acting on incomplete information, causing misguided reactions to dividend announcements (Akerlof, 1970).

Therefore, understanding the role of information asymmetry and the relationship between dividend announcements and stock prices is crucial for investors and financial analysts. Following dividend announcements, reactions based on the market's expectations can significantly affect stock price volatility. This dynamic highlights the importance of comparing dividend announcements against the market's expectations to make informed investment decisions (Jensen & Meckling, 1976).

Given that stock prices are significantly impacted by dividend changes and announcements, it is essential to analyze how market behavior is influenced by the discrepancies between the announced dividends and the consensus estimates. Investigating the stock price reactions to these discrepancies on the Swedish stock market following dividend announcements provides valuable insights. It enhances the understanding of how dividend announcements align with the market's expectations, improving decision-making processes and investment strategies for investors and financial analysts. These complexities make it essential to explore the theoretical foundations explaining how dividend changes and the discrepancies between announced dividends and consensus estimates impact stock prices.

1.2 Problem Description

Dividend policies have long been debated among economists and financial analysts. Miller & Modigliani (1961) proposed the dividend irrelevance theory, arguing that a company's dividend policy is irrelevant to its valuation in perfect capital markets. The theory rests upon the assumption that there are no economic frictions in the capital markets. In reality, these assumptions are affected by various economic frictions, including information asymmetry and irrational investor behavior. These economic frictions influence investor behavior, impacting the company's valuation. As a result, these discrepancies question the practical applicability of the dividend irrelevance theory.

Furthermore, Miller & Rock (1985) formally introduced the signaling theory, which argues that dividend policies are significant since they may be interpreted as a signal for a company's future outlook. Gordon's (1959) research suggests that a firm's value is influenced by its dividend policy, advocating for higher payout policies to maximize a company's market value. This perspective contradicts the assumptions of the dividend irrelevance theory while aligning with the economic frictions present in the capital markets.

In contrast, depending on the efficiency level, the efficient market hypothesis (EMH) assumes that investors are rational and that market prices reflect all available information. According to the hypothesis, even though long-term price deviations and return anomalies inevitably will correct themselves, short-term fluctuations in response to new information can lead to temporarily under or overpriced securities. These frequent price adjustments to new information support the hypothesis of an efficient market (Fama, 1998).

Since these three theories are of significant value for economic research but can contradict each other, it is essential to analyze their actual implications on market behavior. Therefore, this study aims to investigate the stock price reactions on the Swedish stock market to explore possible patterns of discrepancies between announced dividends and the consensus estimates, as well as dividend changes. This may provide abnormal excess returns during the period that follows dividend announcements by incorporating the perspectives of the dividend irrelevance theory, signaling theory, and the efficient market hypothesis.

1.3 Target Audience

This thesis is directed towards investors, financial analysts, and undergraduate students specializing in Corporate Finance. This audience can benefit from understanding how dividend changes and discrepancies between announced dividends and consensus estimates influence stock prices. By enhancing their comprehension of theoretical models related to market behavior and information asymmetry, they can apply this knowledge to practical investment scenarios, such as portfolio management and financial analysis.

1.4 Research Question & Purpose

How do dividend changes and the discrepancies between announced dividends and consensus estimates impact stock prices for Swedish companies following the dividend announcements?

The purpose of this study is to examine the stock price effects of dividend changes and the discrepancies between announced dividends and consensus estimates on the Swedish stock market. This study focuses on identifying cumulative abnormal returns during the period following dividend announcements. The results of this study intend to enhance investors' understanding of how the market's expectations and dividend announcements align, thereby contributing to valuation and trading strategies.

1.5 Delimitation

Several delimitations have been established in this study to ensure relevance and reliability. These delimitations refined the scope of this study by ensuring that it remains specific and meaningful within the chosen context.

1.5.1 Temporal Scope

This study examines the period from January 1st, 2020, to May 13th, 2024. The selected time period captures recent market behavior and trends while ensuring that the findings are relevant and applicable to current financial contexts. The reliability of the results is enhanced by the high-quality data sets used for the chosen period. The chosen 5-year period creates a balance between recency and comprehensiveness while still being sufficient in observing and analyzing the effects of dividend changes and the discrepancies between announced dividends and consensus estimates on stock prices.

1.5.2 Geographic Scope

The study specifically focuses on the 60 largest companies by market capitalization, listed on the Stockholm Stock Exchange (OMXSPI), referred to as the Swedish stock market in this study. Focusing on this single geographic area provides detailed insights into the specific market dynamics and investor behaviors that are present in Sweden. This focus allows for a more precise analysis of the impact of dividend changes and the discrepancies between announced dividends and consensus estimates on stock prices within the context of the

Swedish market, which may differ from other international markets due to differing economic, regulatory, and cultural factors.

2. Theoretical Framework & Literature Review

This chapter presents the foundational theories and relevant prior research, clarifying the historical implications of how dividend changes impact stock prices and the discrepancies between announced dividends and consensus estimates. Furthermore, it presents the formulated hypotheses for the study.

2.1 Efficient Market Hypothesis

As previously discussed, understanding how information impacts stock prices is of crucial value to investors and analysts. The EMH is a fundamental theory in finance that suggests that the prices of securities reflect all information available to the market. Fama (1970) presents the EMH, which is divided into three different categories: weak efficiency, semi-strong efficiency, and strong efficiency. The weak efficiency includes historical price information. The semi-strong efficiency includes historical prices and other information that is perceived as publicly available. The strong efficiency includes historical prices, publicly available information, and information only accessible by a selected group. The stock market is generally assumed to inherit a semi-strong efficiency, which means that the market quickly and effectively incorporates all publicly available information into the stock prices. Since the market is presumed to be semi-strongly efficient, abnormal excess returns can exist based on information that is not publicly available. According to the EMH, these abnormal excess returns should quickly correct themselves as soon as the information is publicly available. Consequently, there is no advantage to using public information since investors cannot achieve consistent abnormal returns using publicly available information.

The EMH also assumes that investors use all the publicly available information, without bias, to formulate their forecasts with rational expectations. However, as proven by behavioral finance theories, all investors are not homogenous. The EMH can be related to the rational expectations hypothesis (REH) presented by Muth (1961), which suggests that any investor's analysis is equivalent to any financial model based on the available information. He also argues that if all investors have the same information, price changes in assets should only reflect the latest news, which cannot be predicted systematically. Shostak (1997) argues that

if market assumptions were truly homogeneous, trading would cease entirely. Shostak's argument is evident in the reality of the financial markets since the daily trading volumes on NASDAQ exchanges range from $200-300 billion (Nasdaq, n.d.).

2.2 Dividend Irrelevance Theory

Miller & Modigliani (1961) proposed the dividend irrelevance theory, highlighting the importance of a company's dividend policy for both investors and economists to evaluate the performance of the capital markets. They question whether companies with generous dividend policies were valued higher as opposed to companies with less generous dividend policies. Additionally, Miller & Modigliani (1961) suggest that in a rational and perfect economic environment, a firm's value should be influenced solely by the earnings of its assets rather than the firm's dividend policy. The dividend irrelevance theory relies on several assumptions: the absence of taxes, the existence of perfect capital markets, and agents acting homogeneously and rationally (Brusov et al., 2021). Another assumption that Miller & Modigliani (1961) make is that all additional projects have a net present value (NPV) of zero. Therefore, according to the theory it makes no difference to an investor whether a company pays out its earnings as a dividend or retains them in the company. They also argue that the total value the investor receives remains the same in either scenario.

2.3 Signaling Theory

When Gordon (1959) developed the Gordon Growth Model (GGM), he highlighted the importance of dividends in stock valuation and implied that dividends are a crucial indicator of a company's value and growth prospects. The GGM explains that the dividend amount, as well as its growth rate, is directly correlated with the stock price valuation, which implies that the company's value is directly correlated to the dividends.

During the same year, Lintner (1959) published his paper observing companies' tendencies to strive for a target payout ratio based on long-term sustainable earnings by gradually adjusting their dividends, allowing them to avoid making abrupt changes to their dividend policies. His empirical studies showed that companies follow stable dividend policies and suggested that dividends signal information about companies' earnings stability and future outlook.

The theory about dividends explicitly modeled as signals in markets with asymmetric information was credited to Miller & Rock (1985). Their paper provided a theoretically detailed framework and mathematical modeling, explicitly addressing how and why markets with conditions of asymmetric information can be analyzed with the signaling theory.

Miller & Rock (1985) further suggest that dividend increases signal a positive outlook regarding future earnings, implying a positive correlation between dividends and earnings. Therefore, dividends are seen as a positive signal, which suggests that after a company announces a dividend increase, the company's stock price should increase. They argue that this is partly explained by the information asymmetry that exists between corporate managers and investors.

2.4 Prior Research

When examining how dividend changes and the discrepancies between announced dividends and consensus estimates impact stock prices, it is necessary to understand the underlying financial theories and their empirical validations. The EMH, the dividend irrelevance theory, and the signaling theory provide a foundational understanding of dividends' role in the capital markets. Each theory offers a distinct perspective on market behavior and dividends' informational role.

To analyze these theoretical perspectives comprehensively, it is essential to review prior empirical studies that have tested the theories in various market conditions. This helps connect the theoretical predictions with real-world observations while specifically focusing on the Swedish stock market. The prior research highlights patterns and differences that support the practical relevance of each theory, enhancing the understanding of how dividend changes and the discrepancies between announced dividends and consensus estimates impact stock prices.

2.4.1 Efficient Market Hypothesis

Alkebäck's (1997) study on the Swedish stock market examined the market's reactions to dividend changes, offering important insights into market efficiency. His research found statistically significant market reactions for companies that made unexpected positive dividend announcements. For companies with unchanged or decreasing dividend

announcements, the abnormal returns were not found to be statistically significant. This aligns with the semi-strong form of the EMH as well as the signaling theory, suggesting that dividends convey information about a company's future outlook.

The semi-strong form of the EMH is further supported by Denis, Denis & Sarin's (1994) study, examining the information conveyed by dividend changes and how they impact stock prices through future cash flow signaling. They found that both positive and negative dividend changes are reflected accordingly within the stock price.

Additionally, Hartzmark & Solomon's (2019) examination of investor behavior provides clarification of the psychological aspects behind the market's reactions to dividend announcements. They found that some retail investors, mutual funds, and institutions trade with the perception that stock price returns and dividend payouts are to be categorized separately. This behavior may result in misaligned investment decisions based on historical price changes rather than total returns, causing investors to overlook dividends. Furthermore, this implies that analysts' failing to account for dividends leads to misrepresenting consensus estimates, a result driven by psychological factors rather than economic ones. This challenges the assumptions of the EMH and REH regarding rational and unbiased investor behavior.

2.4.2 Dividend Irrelevance Theory

Miller & Modigliani (1961) argue that a company's dividend policy is irrelevant to its valuation in perfect capital markets. Berezinets et al. (2019) study found that the Russian stock market reacted negatively to dividend changes, regardless of their direction, aligning with the dividend irrelevance theory.

However, the theory is challenged by Alkebäck's (1997) study on the Swedish stock market, showing that the market reacts to unexpected dividend changes, which suggests that dividends can have an impact on stock prices, contradicting the dividend irrelevance theory. Furthermore, Hartzmark & Solomon (2019) suggest that, in practice, the dividend irrelevance theory may not be accurate due to psychological factors. Their findings imply that economic frictions, such as information asymmetry and irrational investor behavior, influence investment decisions, which impact the valuation of a company.

2.4.3 Signaling Theory

Miller & Rock's (1985) signaling theory is supported by Choi (1990), who found that stock prices correlate with unexpected dividend changes. Denis, Denis & Sarin's (1994) study also supports the signaling theory since they demonstrate a positive relationship between excess returns and the size of the dividend change, indicating that dividend changes signal information about a company's future prospects. Their results can be related to asymmetric information since they imply that corporate managers have more information than investors about a company's future outlook.

Additionally, Lintner's (1956), and Asquith & Mullin's (1983) studies suggest that dividend announcements have a crucial effect on stock prices through providing new information to the market, causing significant stock price changes based on new investor expectations.

As previously mentioned, Berezinets et al. (2019) did not find any significance regarding a dividend's relevance to company valuation on the Russian stock market. However, they found significance between dividend changes and stock prices on the Indian stock market, supporting the signaling theory. Since they did not find any significance on the Russian stock market, it suggests that the dividend irrelevance theory, as well as the signaling theory's practical implications, may differ depending on the studied market. This makes it valuable to conduct a study on the Swedish stock market since prior research has not thoroughly tested the subject on this market.

Gruber, Elton & Gultekin (1981) emphasize the importance of consensus estimates for interpreting market reactions. They demonstrate that these estimates offer investors a reference against which to assess company performance. Understanding the role of consensus estimates is valuable when determining how market expectations correspond with a company's future outlook, resulting in stock price changes.

Andres et al. (2013) highlight the importance of using analysts' forecasts to provide accurate insights about dividend expectations. By comparing announced dividends with consensus estimates, this study is able to more accurately assess how the market's expectations align with actual company performance. Andres et al. (2013) found that the discrepancies between dividend announcements and consensus estimates significantly impact stock prices. This

provides a deeper understanding of how dividend changes and dividend announcements impact stock prices.

2.5 Implications of Research Findings

As previously mentioned, the prior research, along with the theories, provide a foundational understanding of the dividend's role in the capital markets. Through examining the research gap on the Swedish stock market, the purpose of this study is to test the theoretical predictions in a real-world context, particularly focusing on dividend changes and the discrepancies between announced dividends and consensus estimates. The findings from Alkebäck (1997), Denis, Denis & Sarin (1994), Lintner (1956), Asquith & Mullins (1983), Gruber, Elton & Gultekin (1981), and Hartzmark & Solomon (2019) suggest that stock markets may exhibit characteristics that can challenge or validate the financial theories. Due to the mixed evidence from different markets, such as Berezinets et al. (2019) findings from the Russian and Indian stock markets, makes it evident that market-specific factors play an essential role in investors' reactions to dividend announcements. Therefore, this study provides implications for investors and financial analysts, enhancing the understanding of how market expectations and dividend announcements align. Through leveraging consensus estimates, this study also highlights the importance of accurate market forecasts to reduce information asymmetry and improve market efficiency.

2.6 Formulated Hypotheses

Hypothesis 1: Impact of the discrepancies between announced dividends and consensus estimates on stock returns.

> **Null Hypothesis (H0)**: The discrepancies between announced dividends and consensus estimates do not result in significant abnormal returns on stock prices compared to negative differences.

> **Alternative Hypothesis (H1)**: The discrepancies between announced dividends and consensus estimates result in significant abnormal returns on stock prices compared to negative differences.

Hypothesis 2: Impact of dividend changes on stock returns.

> **Null Hypothesis (H0)**: Changes in dividend announcements do not result in significant abnormal returns on stock prices.
>
> **Alternative Hypothesis (H1)**: Changes in dividend announcements result in significant abnormal returns on stock prices.

3. Methodology

This chapter outlines the research design, including the sample selection and data collection methods. It specifies the dependent and independent variables, as well as the event windows used in the study. Additionally, the chapter presents the variable statistics and discusses the validity, reliability, and replicability of the findings, and the employed regression model. The chapter concludes by addressing the study's limitations.

3.1 Research Design

The study is based on a quantitative research method that examines how changes in dividends and the discrepancies between announced dividends and consensus estimates impact the stock prices of Swedish Companies. Through quantitative methods, this study aims to discover patterns, test theories, and establish the relationships between the market's dividend expectations, measured through consensus estimates, and the market's reactions following the dividend announcements. The study builds on prior research and integrates established theoretical frameworks to strengthen the analysis and contextualize the findings. A deductive approach is used to examine the theories' practical applicability, aligning theoretical frameworks with real-world market behavior (Bryman & Bell, 2017, pp. 42-43).

3.2 Sample Selection & Data Collection

The study utilized dividend announcement data on the 60 largest publicly listed companies on the Swedish stock market, obtained from LSEG Eikon. The selection was based on the reasoning that larger companies offer greater credibility and availability of the consensus estimates through a larger quantity of analysts' forecasts. Additionally, Dasilas & Leventis (2011) used a similar sample size. However, to ensure the quality and relevance of the data,

the sample was narrowed down to 39 (Table A4) companies as a result of removing those lacking sufficient consensus estimates for the period ranging from January 2020 to May 2024.

- Historical consensus estimates were obtained from LSEG Eikon. More specifically, Smart Estimates were used to improve the accuracy of the mean estimates since they are based on recent forecasts and estimates from top-rated analysts.

- Historical dividend announcements and stock prices were also obtained from LSEG Eikon. The historically announced dividends and their announcement dates were sourced from January 2020 to May 2024. The number of years selected for analysis is based on prior research by Hartzmark & Solomon (2019) and Dasilas & Leventis (2011), which used data from January 1991 through November 1996 and January 2000 through December 2004, respectively.

- Historical changes in dividend announcements were sourced from LSEG Eikon for the period ranging from 2019 to 2024.

- Historical stock prices were sourced from July 2nd, 2019, to May 13th, 2024, in order to calculate normal returns for our chosen time period.

- Historical Swedish interest rates were obtained from the Swedish central bank (Riksbanken). More specifically, the 5-year treasury note from July 2nd, 2019, to May 13th, 2024, was collected to provide a reasonable estimate for the risk-free rate over the time period and to calculate the normal returns. Incorporating the risk-free rate accounts for the time value of money, thereby better isolating the stock's performance relative to the market.

- Historical daily returns for the market portfolio (OMXSPI) were obtained from LSEG Eikon to provide a benchmark for the Swedish stock market's overall performance. This data was also collected for the period from July 2nd, 2019, to May 13th, 2024, to calculate the normal returns.

In conclusion, the data collection procedure provided a solid foundation for the analysis. By gathering detailed historical data on consensus estimates, announced dividends, stock prices, interest rates, and market returns, the study is well-suited to examine the impact of dividend changes and the discrepancies between announced dividends and consensus estimates on stock prices. This approach ensures that the findings are based on accurate and comprehensive data, enhancing the reliability and validity of this study.

3.3 Definition of Variables

3.3.1 Dependent Variable

3.3.1.1 CAR

The dependent variable within this study is the cumulative abnormal return (CAR). The use of CAR provides a more explanatory model to interpret persistent effects rather than examining the abnormal return for each trading day within the event window (Brooks, 2019, pp. 575-576). When calculating CAR within each event window, the market model is initially used to determine the normal return for each stock prior to the event window, explained by the following equation:

$$R_{i,t} = \alpha_i + \beta_i * R_{m,t} + \varepsilon_{i,t}$$

$R_{i,t}$ represents the normal return for the stock during the estimation window, ranging from 100 to 5 trading days before the announcement date. α_i reflects the return for company *i*'s stock when market returns are zero. β_i represents the company's stock return sensitivity for the chosen market and its return. $R_{m,t}$ is the return of the selected market *m* at time *t*. The residual term $\varepsilon_{i,t}$ portrays the individual company's stock return that is not reflected by the chosen market's return. The idiosyncratic risk of the firm is incorporated into the normal returns; this term represents the existence of additional factors affecting the return other than the market return. (Brooks, 2019, p. 574).

The following equation is used to calculate the abnormal return for each stock within each event window:

$$AR_{i,t} = (R_{i,t} - Rf_{t,daily}) - [\alpha_i + \beta_i * (R_{m,t} - Rf_{t,daily})]$$

In this equation, $AR_{i,t}$ is the abnormal return for the stock *i* during the event window. $Rf_{t,\,daily}$ is the risk-free rate during time *t*. The yield of the treasury note is converted into a daily risk-free rate by dividing the treasury note rate at time *t* by 360, as shown below:

$$Rf_t = \frac{Treasury\ note\ rate_t}{360}$$

The CAR for the event window is then calculated as the sum of $AR_{i,t}$ over the trading days within each event window and year:

$$CAR_i(T_1, T_2, T_3, T_4, T_5) \sum_{t=T_1}^{T_5} AR_{i,t}$$

3.3.2 Independent Variables

3.3.2.1 ADCE

The first independent variable within the study is the discrepancies between the announced dividends and the consensus estimates for the dividend (ADCE). It is calculated as a percentage difference using the following equation:

$$ADCE_{i,t} = \frac{Announced\ Dividend_{i,t} - Consensus\ Estimate\ for\ the\ Dividend_{i,t}}{Consensus\ Estimate\ for\ the\ Dividend_{i,t}}$$

The calculation of ADCE into a percentage instead of a number increases the analyzability while incorporating companies with differing announced dividend amounts. Using ADCE is based on prior research by Andres et al. (2013). The use of ADCE provides an additional foundation for explaining CAR over the event windows while incorporating the aforementioned theories within the analysis of the results.

Further categorical variables were created to conduct sub-sample analysis. Specifically, the variables positive ADCE (P_ADCE) include the observations in which ADCE was positive, as well as negative ADCE (N_ADCE) representing the observations where ADCE was negative.

3.3.2.2 DC

The second independent variable used within this study is dividend changes (DC). The variable is expressed as a percentage to improve the analyzability of the companies within the same model. The equation for DC is as follows:

$$DC_{i,t} = \frac{D_t - D_{t-1}}{D_{t-1}}$$

Where D_t is the dividend announced by the company at time *t,* and D_{t-1} is the dividend announced the previous year. The use of percentages for the dividend change is based on prior research (Alkebäck, 1997), which provides data less susceptible to effects from outliers, even after controlling and transforming the data.

To robustness test the findings through sub-sample analyses, categorical variables for DC were created; P_DC and N_DC were computed using the positive announced dividend changes and negative dividend changes, respectively.

3.4 Event Windows

To provide comparable results to previous research while also providing a foundation for future studies, different event windows were used to improve the results of this study. The event window from announcement day through the following trading day (CAR1) aims to capture the immediate effects of dividend announcements. This approach accounts for variations in the timing of dividend announcements within our sample. Prior research conducted by Pettit (1972) and Hartzmark & Solomon (2019) examines the event window ranging from the announcement day to the seven following trading days, which should provide an additional pricing effect to be explicated, which is further referred to as CAR2 in this study. Consequently, the decision to analyze a third event window, spanning from the announcement day through the 14 subsequent trading days (CAR3), addresses a gap in existing research regarding ADCE. This extended event window provides a comprehensive foundation for future studies to build upon in their analyses.

3.5 Variable Statistics

Table 1. Transformed Variables used within the OLS regression analyses.

Transformed Variables	*N*	*Mean*	*Median*	*Min*	*Max*	*Standard Deviation*	*Skewness*	*Kurtosis*
ADCE	195	-0.0077325	0	-0.2944082	0.2312813	0.1242935	-0.4095389	3.252738
P_ADCE	97	0.0848378	0.0626819	0.0036956	0.2675924	0.0777307	1.017757	2.956054
N_ADCE	92	-0.1131136	-0.0747825	-0.4345069	-0.0068382	0.1188411	-1.359065	3.998071
DC	191	0.1292208	0.0909091	-0.2666667	0.75	0.2283284	0.9617492	4.329951
P_DC	146	0.2228573	0.1213235	0.0352941	1.066667	0.2586996	2.199143	7.219613
N_DC	26	-0.1458531	-0.2451117	-0.5384615	-0.0243902	0.1783307	-0.671865	2.55512
CAR1	195	0.0026933	0.0022882	-0.0779797	0.0920111	0.0446798	0.1265336	2.433648
CAR2	195	0.0018607	0.0017466	-0.1011507	0.118321	0.0574562	0.194347	2.456089
CAR3	194	0.0028232	0.001808	-0.1115065	0.1330591	0.0672275	0.0996728	2.269719

Table 1 shows the final sample of transformed variables. These variables have been analyzed and transformed to account for outliers. The values of the variables before transformation can be found in the appendix (Table A1). The process of winsorizing variables at a 5% interval provides a more precise fit for the results, assuring that they are not reliant on large deviations in values. In theory, these could be attributed to factors other than the variables the study analyzes. The winsorizing process results in the outliers at the top and bottom of each variable's tails being replaced by the nearest value. By transforming the variables, the minimum and maximum values are not remarkably different from the mean values, as opposed to the pre-transformation values (Table A1), proving the winsorizing process efficiently replaces the outliers.

Before the transformation, the outliers for the variables DC and P_DC had skewness values of 10.21453 and 126.1963 and kurtosis values of 9.79701 and 108.9304, respectively. After the transformation, DC's skewness was reduced to 0.9617492, and kurtosis was reduced to 4.329951, providing more reliable results when incorporated into the analysis. As a result of the chosen period, the variable N_DC comprised only 26 observations. This limited number of observations makes the variable unsuitable for inclusion in a regression model, similar to the findings in Alkebäck's (1997) study, where the number of firms with decreasing dividends was also notably low.

Furthermore, a 90% confidence interval is utilized to capture a wider range of results and better examine the impact of the variables in our study. This approach is particularly beneficial given that the sample size is relatively small, as confidence intervals tend to be wider in such cases, providing a more realistic range of potential values.

The study benefits from a 90% confidence interval since it balances precision with the risk of missing significant findings. This interval reduces the likelihood of Type II errors, which occur when an effect is present but not detected. By acknowledging a broader potential variation in the data, a 90% confidence interval can provide more robust and comprehensive conclusions about the variables' impact in this study. This approach is used by Denis, Denis & Sarin (1994) and Alkebäck (1997).

3.6 Validity

In this study, validity is a critical criterion, ensuring that the findings are causally linked and that the relationships between the dependent and independent variables are accurate. This aspect of validity requires that the coefficients of the independent variables accurately represent their effects on the dependent variable without being influenced by other factors. Conceptual validity in quantitative research aims to ensure that the variables used in the study correctly represent the underlying concepts being investigated without mistakenly attributing the effects to unrelated factors (Bryman & Bell, 2017, p. 69).

3.7 Reliability & Replicability

The reliability of the results reflects the extent to which a study can be replicated with consistent outcomes by other researchers (Bryman & Bell, 2017, pp. 68-69). A factor that raises concerns about the replicability of this study is the use and availability of consensus estimates provided by LSEG Eikon. The underlying calculation methods for these estimates are not disclosed, raising concerns about their reliability. This could mean that any retroactive changes made by the provider could alter the historical estimates, potentially preventing the study's findings from being accurately replicated. However, the replicability of the other variables in this study is ensured, as they can be calculated and sourced from different databases, confirming the replicability of these study aspects.

3.7.1 Ordinary-Least Square Regression

An Ordinary-Least-Square (OLS) regression analysis explains the relationship between a variable and multiple independent variables, specifically ADCE ($\beta_1 ADCE$) and DC ($\beta_2 DC$), along with their sub-sample variables, affect the dependent variable (Brooks, 2019, p. 94). This analysis is designed to answer the stated hypotheses. The regression equation is formulated as follows, with modifications for each sub-sample variable for ADCE and DC:

$$CAR = \beta_0 + \beta_1 ADCE + \beta_2 DC + u_i$$

To ensure the reliability of the regression results, a proactive analysis is conducted to verify that the mean of the error term u_i, is constant, $E(u_i) = 0$, as shown in the appendix (Table A2), with the value being close enough to zero to be acceptable. This constant within the regression equation confirms the fulfillment of this requirement. Furthermore, the need for

homoscedasticity in the sample is essential, indicating that the variance of the error term is constant, $Var(u_i) = \sigma^2 < \infty$. To fulfill this criterion, robust standard errors are employed throughout this study due to the inability to conduct the Breusch-Pagan/Cook-Weisberg test on the data. To address data skewness and high kurtosis, the variables were winsorized to mitigate the impact of outliers, as previously mentioned. The potential multicollinearity among the independent variables is controlled to ensure they are not highly correlated. A correlation matrix was created to establish the absence of significant correlations between the variables (Table A3).

3.8 Limitations

Acknowledging that the prior research on this subject may be considered outdated due to its publication years, this study addresses the gap by providing updated insights. Given the lack of recent extensive research on the topic, this study helps bridge the gap in understanding how dividend changes and the discrepancies between announced dividends and consensus estimates impact stock prices on the Swedish stock market. Recognizing this limitation highlights the importance of conducting contemporary analysis in this area, thereby extending the possibility for further research to explore these effects in recent years.

The limitations in the data and methodology primarily originate from the market selection and the analyzed period. Analyzing a single market to achieve generalizability in market behavior over the selected five-year period presents challenges when dividing variables into their respective sub-samples. The insufficient number of negative dividend changes during this period undermines the reliability of the results for that variable, leading to its exclusion from the analysis. Additionally, transforming all variables into percentage changes makes the data unusable for observations where dividends increased from zero, further constraining the study's scope.

3.9 GDPR & Artificial Intelligence

It is important to note that the study did not encounter any issues related to the regulatory constraints of the General Data Protection Regulation (GDPR). This is because no personal information was used in the study, ensuring full compliance with GDPR requirements.

Likewise, the study did not utilize artificial intelligence, therefore no explanation is needed about its impact.

4. Results

This chapter presents a comprehensive summary of the data, incorporating various multiple linear regression analyses to address the research question and test the hypotheses. The analysis is segmented into different event windows (0-1, 0-7, and 0-14 trading days) to examine the immediate and short-term effects of ADCE and DC on CAR. Through detailed multiple linear regression models, the chapter evaluates the significance of ADCE and DC's effects on CAR. Robustness tests are also conducted to ensure the reliability and validity of the findings.

4.1 Event Window, 0-1 Trading Days (CAR1)

Table 1. Regression Results from CAR1 for the effect of ADCE and DC, 191 observations.

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
ADCE	0.0021986	0.0244874	0.928
DC	0.0239556*	0.0142333	0.092
$R^2 = 0.0150$			

*Significance level *: Statistically significant at 10%.*

The results from Table 1 provide an initial understanding of the effect ADCE and DC have on CAR during the event window. It is evident that the variable DC has a statistically significant effect on the variation of CAR, with a significance level marked by one star (10% significance level). Specifically, DC explains an increase of 0.0239556 in CAR per unit increase in DC, holding all other factors constant (ceteris paribus). On the other hand, ADCE does not have a statistically significant impact on CAR, evidenced by its high P-value of 0.928. Furthermore, this model explains 1.5% of the variation in CAR. The robust standard error value provided for DC results in an interval that precisely fits the model, whereas ADCE does not have a significant effect on CAR with its coefficient of 0.0021986 and larger standard error value of 0.0244874, compared to DC's standard error value of 0.0142333.

Table 2. Regression Results from CAR1 for the effect of N_ADCE and P_DC, 65 observations.

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
N_ADCE	-0.0402303	0.0424529	0.343
P_DC	0.0092968	0.0201286	0.644
$R^2 = 0.0544$			

Significance level: No level of significance.

The regression analysis results from Table 2 are based on 65 observations, where the sub-sample variables, N_ADCE and P_DC, are analyzed. The coefficients for N_ADCE and P_DC are -0.0402303 and 0.0092968, respectively. The robust standard error values from this model were 0.0424529 for N_ADCE and 0.0201286 for P_DC. However, neither variable reached statistical significance, as indicated by their p-values.

Table 3. Regression Results from CAR1 for the effect of P_ADCE and P_DC, 76 observations.

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
P_ADCE	0.0426705	0.0706858	0.546
P_DC	0.0237176	0.0146161	0.105
$R^2 = 0.0307$			

Significance level: No level of significance

Table 3 presents the result from the regression analysis, aimed to convey the effect of the sub-sample variables, P_ADCE and P_DC. The independent variables P_ADCE and P_DC have positive coefficients of 0.0426705 and 0.0237176, respectively. These variables do not achieve statistically significant p-values, with values of 0.546 for P_ADCE and 0.105 for P_DC. Along with robust standard error values of 0.0706858 for P_ADCE and 0.0146161 for P_DC. Therefore, neither variable provides significance regarding the explained variation of 3.07% in CAR.

4.1.1 Summary of CAR1

As shown in Table 1, the only observed significant effect on CAR during the event window is associated with DC. The one-star statistical significance explains 1.5% of the variation in CAR across the model. ADCE does not significantly impact CAR; the robust standard errors within the model signal a precise fit within the interval. The further analysis involving N_ADCE, P_DC, as well as P_ADCE and P_DC, did not reach statistical significance. The additional sub-sample analyses, which incorporated the categorical variables N_ADCE, P_DC as well as P_ADCE were not able to provide further explanations for the variation in CAR at any level of significance.

4.2 Event Window, 0-7 Trading Days (CAR2)

This section presents the regression analysis results for the event window CAR2. The results show the impact of ADCE and DC on CAR during the period.

Table 4. Regression Results from CAR2 for the effect of ADCE and DC, 191 observations.

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
ADCE	-0.0026191	0.0283014	0.926
DC	0.0490253***	0.018312	0.007
$R^2 = 0.0343$			

*Significance level ***: Statistically significant at 1%.*

Table 4 shows the regression results for the effect of ADCE and DC on CAR during CAR2. The coefficient for DC indicates an increase in CAR of 0.0490253 per unit increase in DC, with a three-star level of statistical significance. ADCE does not have a significant effect on CAR, as evidenced by its p-value of 0.926, and has a coefficient of -0.0026191. The 3.43% change of variation in CAR can be accredited to the model. The robust standard errors for DC are 0.018312 and 0.0283014 for ADCE, ensuring DC provides an accurate interval of spread within the model.

Table 5. Regression Results from CAR2 for the effect of N_ADCE and P_DC, 65 observations.

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
N_ADCE	0.0024471	0.072939	0.973
P_DC	0.0464545*	0.0266548	0.081
$R^2 = 0.0318$			

*Significance level *: Statistically significant at 10%*

Table 5 shows that N_ADCE has a coefficient of 0.0024471 and not showing any significance on the effect on CAR. P_DC has a positive effect on CAR with an increase of 0.0464545 per unit increase in P_DC is shown by its coefficient, which has a one-star level of significance. The robust standard errors value for P_DC, along with the weaker significance, suggests a less precise fit of the model compared to Table 4. This model explains 3.18% of the variation in CAR.

Table 6. Regression Results from CAR2 for the effect of P_ADCE and P_DC, 76 observations

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
P_ADCE	0.1046399	0.0856108	0.222
P_DC	0.0267162	0.0191307	0.163
$R^2 = 0.0482$			

Significance level: No level of significance

Table 6 shows that P_ADCE has a coefficient of 0.1046399 and that P_DC has a coefficient of 0.0267162. Neither variable reached statistical significance, as indicated by the p-values of 0.222 and 0.163, respectively. Therefore, neither variable provides significance regarding the explained variation of 4.82% in CAR. Within this model, the standard errors for P_DC are 0.0191307 and 0.0856108 for P_ADCE.

4.2.1 Summary of CAR2

The results from CAR2 indicate that DC, with its positive coefficient, has a significant impact on CAR, as shown in Table 4. P_DC also shows that with its positive coefficient, it has a significant effect on CAR in Table 5, while ADCE and N_ADCE do not reach significance, as shown in Tables 4 and 5, respectively. Table 6 shows that neither P_ADCE nor P_DC significantly impact CAR. The models explain a proportion of the variation in CAR, with DC and P_DC having a significant impact on CAR, within the analyzed event window.

4.3 Event Window, 0-14 Trading Days (CAR3)

This section presents the regression analysis results for the event window CAR3. The results show the impact of ADCE and DC on CAR as well as the sub-sample variables during the period.

Table 7. Regression Results from CAR3 for the effect of ADCE and DC, 190 observations.

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
ADCE	-0.005676	0.0420808	0.893
DC	0.0670977**	0.0291321	0.021
$R^2 = 0.0524$			

*Significance level **: Statistically significant at 5%*

Table 7 presents that DC has a coefficient of 0.0670977, indicating an increase in CAR per unit increase in DC, with a two-star level of significance. ADCE has a coefficient of

-0.005676 and does not show a significant effect on CAR, with a p-value of 0.893. The estimates of robust standard errors provide low values of 0.0291321 for DC and 0.0420808 for ADCE. The model explains 5.24% of the variation in CAR.

Table 8. Regression Results from CAR3 for the effect of N_ADCE and P_DC, 65 observations.

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
N_ADCE	-0.0364262	0.0942567	0.699
P_DC	0.0876114***	0.0283596	0.002
$R^2 = 0.0544$			

*Significance level ***: Statistically significant at 1%*

Table 8 shows that P_DC has a coefficient of 0.0876114, achieving a three-star level of statistical significance, indicating an increase in CAR by the coefficient value, per unit increase in P_DC. N_ADCE has a coefficient of -0.0364262 and does not show significance with its p-value of 0.699. The model explains 5.44% of the variation in CAR. The significant variable P_DC in this model provides its robust standard errors value of 0.0283596, while N_ADCE's robust standard errors value is 0.0942567.

Table 9. Regression Results from CAR3 for the effect of P_ADCE and P_DC, 76 observations.

Variables	*Coefficients*	*Robust Standard Errors*	*p-value*
P_ADCE	0.1276797	0.1056426	0.227
P_DC	0.0430522	0.0337692	0.202
$R^2 = 0.0471$			

Significance level: No level of significance

Table 9, shows that P_ADCE has a coefficient and robust standard errors value of 0.1276797 and 0.010564296, respectively, as well as a p-value of 0.227 showing no statistical significance. Additionally, P_DC has a coefficient of 0.0430522 and a p-value of 0.202, also showing no significance with a robust standard errors value of 0.0337692. Therefore, neither variable provides statistical significance regarding the explained variation of 4.71% in CAR.

4.3.1 Summary of CAR3

The results from CAR3 indicate that DC, with its positive coefficient, has a significant impact on CAR, as shown in Table 7, with statistical significance at the 5%-level. ADCE does not achieve significance in Table 7. Table 8 shows that P_DC, with its positive coefficient, has a significant impact on CAR at the 1%-level, while N_ADCE does not reach significance. In Table 9, neither P_ADCE nor P_DC show a significant impact on CAR. The models explain

a proportion of the variation in CAR, with DC and P_DC having a significant impact on CAR, within the analyzed event window.

5. Analysis

This chapter presents a comprehensive analysis of the data, addressing the research question and testing the hypothesis by incorporating various multiple linear regression analyses. The analysis is based on the previously discussed theoretical framework and builds on prior research. It is structured based on the different event windows to examine the immediate and short-term effects of ADCE and DC on CAR. Robustness tests were analyzed to ensure the reliability and validity of the findings through longer event windows (CAR2 & CAR3) and sub-sample analyses. When interpreting the results, it is important to acknowledge the fact that each event window is analyzed separately, ultimately causing the different event windows to be summarized in a similar manner.

5.1 Event Window Analysis, 0 - 1 Trading Days (CAR1)

Understanding the immediate market reactions to dividend announcements is of crucial value for analyzing the market's efficiency in interpreting and incorporating new information. In the event window CAR1, the regression analysis shows that DC, with its positive coefficient, has a significant impact on CAR. The result supports the signaling theory since it indicates that dividend changes convey information about the company's future outlook. Observing that the market reacted immediately suggests that investors interpret changes in dividends as signals, rejecting H0 and supporting H1 of the second hypothesis, aligning with the prior research by Denis, Denis & Sarin (1994) that found that dividend changes significantly impact stock prices, regardless of the direction of the change.

Since ADCE fails to reject H0 of the first hypothesis, showing no significant impact on CAR within the short event window, it suggests that the market may not immediately react to whether the dividend announcements exceeded or fell short of the market's expectations, contradicting Andres et al. (2013) research, which found that consensus estimates have an immediate statistically significant impact on stock prices. The significant reaction to DC during the event window shows that the market quickly incorporates this new information.

Tables 2 and 3 present results indicating no significant effect on CAR from the analyzed variables N_ADCE, P_DC, P_ADCE, and P_DC, respectively. These results align with the dividend irrelevance theory, as the dividend announcements related to N_ADCE & P_DC (Table 2) and P_ADCE & P_DC (Table 3) do not significantly impact stock prices. These results are supported by Berezinets et al. (2019), as their study on the Russian stock market also found no significant impact of dividend's relevance on company valuation. However, the signaling theory is contradicted by these results, as they indicate that the variables, based on their lack of statistical significance, do not signal information about a company's future outlook. The results also contradict Choi's (1990) and Denis, Denis & Sarin's (1994) studies that found a positive correlation between unexpected dividend changes and stock prices, which the results from Tables 2 and 3 fail to achieve. Therefore H0 for both the first and the second hypothesis are not rejected.

The findings provide inconsistent evidence regarding the market efficiency in the semi-strong form of the EMH, which argues that all publicly available information, including dividend announcements, should be reflected in the stock prices. The statistically significant impact of DC supports the semi-strong form of the EMH, indicating that markets adjust stock prices based on new public information. On the other hand, the lack of significant effects for the variables in Tables 2 and 3 suggests that not all public information is quickly incorporated into stock prices. This indicates potential market inefficiencies or that there are other factors influencing investor behavior.

5.2 Event Window Analysis, 0 - 7 Trading Days (CAR2)

The results from CAR2 provide differing confirmations and contradictions when compared to prior research and theoretical frameworks. Table 7 shows that the variable DC achieved statistical significance, while ADCE did not. These findings are consistent with Denis, Denis & Sarin (1994), who found that dividend changes significantly impact stock prices, regardless of their direction. Moreover, this supports the signaling theory, which suggests that dividend changes provide information about a company's future outlook. Ultimately, not rejecting H0 for hypothesis 1, but the results do reject H0 and support H1 for hypothesis 2.

Table 5 presents results that align with the signaling theory, indicating a positive relationship between future earnings and dividend increases. Furthermore, the studies by Lintner (1956)

and Asquith & Mullins (1983) also support the idea that dividend announcements provide new market information, leading to a significant stock price change based on revised investor expectations, aligning with these findings. However, the findings differ from those found by Andres et al. (2013). Consequently, these results also do not reject H0 for hypothesis 1, but the results reject H0 and support H1 for hypothesis 2.

Table 6 shows that neither P_ADCE nor P_DC reached statistical significance. This outcome aligns with the dividend irrelevance theory by Miller & Modigliani (1961), which suggests that dividend announcements should not affect a company's value. Berezinets et al. (2019) found similar results on the Russian stock market, supporting the findings in Table 6. However, the results contradict Alkebäck's (1997) study, which found that the Swedish stock market reacted to unexpected dividend changes. Moreover, Hartzmark & Solomon (2019) argued that economic frictions affect investment decisions and company valuations, a factor not reflected in the results of Table 6. According to the signaling theory, dividend announcements should give indications of a company's future value and thus affect CAR. Choi (1990) and Denis, Denis & Sarin (1994) found a positive relationship between unexpected dividend changes and stock prices, which the results do not support. Resulting in H0 for both hypotheses not being rejected.

Examining these findings within the framework of the semi-strong form of the EMH provides nuanced insights. The significant impact of DC, as evidenced in Table 4, implies that the market responds to dividend changes, aligning with the semi-strong form of the EMH. Similarly, P_DC in Table 5 supports the EMH, suggesting that the market integrates the informational content of dividend announcements into stock prices. However, the lack of significance for N_ADCE in Table 5 and P_ADCE & P_DC in Table 6, challenges the argument that all publicly available information regarding dividends is quickly reflected upon in the stock prices. This inconsistency could be attributed to market inefficiencies or other factors that influence investor behavior.

5.3 Event Window Analysis, 0 - 14 Trading Days (CAR3)

The results from CAR3 both align with and contradict prior research and the theoretical framework. Table 7 presents the variables ADCE and DC, with statistical significance achieved only for DC. This finding is consistent with Denis, Denis & Sarin (1994), who

reported that dividend changes, regardless of their direction, significantly affect stock prices, which also aligns with the signaling theory. Berezinets et al. (2019) findings from the Indian stock market indicate the same results. These results do not reject H0 for the first hypothesis but do reject H0 and support H1 for the second hypothesis.

Table 8 shows results that differ from those of Andres et al. (2013). While they concluded that dividend changes are not an effective measure for capturing the informational content of dividend announcements, they argued that consensus estimates instead provide a more appropriate measure. The signaling theory, which suggests a positive correlation between dividends and future earnings, is consistent with these findings since dividend increases signal a positive future outlook. Additionally, Lintner's (1956) and Asquith & Mullin's (1983) studies argue that dividend announcements provide new information to the market, leading to significant changes in stock prices based on new investor expectations, also aligning with the results of Table 8. These results do not reject H0 for the first hypothesis but do reject the H0 and support the H1 for the second hypothesis, as well.

Table 9 presents findings where neither P_ADCE nor P_DC reached statistical significance. This outcome aligns with the dividend irrelevance theory, which suggests that dividend announcements do not influence a company's value. Berezinets et al. (2019) study also found no significant impact of dividend relevance on company valuation in the Russian stock market, which supports the results in Table 9. However, these results contradict Alkebäck's (1997) findings that the Swedish stock market reacts to unexpected dividend changes. Hartzmark & Solomon (2019) suggested that economic frictions influence investment decisions and company valuation, but the results in Table 9 do not reflect this impact. According to the signaling theory, dividend announcements should indicate a company's future outlook, which is contradicted by the lack of significant effects on CAR by P_ADCE and P_DC. This also contradicts Choi's (1990) and Denis, Denis & Sarin's (1994) studies, which found a positive relationship between stock prices and unexpected dividend changes, which these results fail to confirm. Ultimately resulting in neither of H0 for both hypotheses being rejected.

These findings can be further examined within the context of the semi-strong form of the EMH. The significance of DC in Table 7 indicates that the market reacts to dividend changes, aligning with the EMH, as it suggests that investors adjust their expectations about stock

prices accordingly when new public information is released. The results in Table 8, showing a positive coefficient with statistical significance for P_DC, also support this view, as they suggest that the market incorporates the informational content of dividend changes into stock prices. However, the lack of significance for N_ADCE in Table 8, P_ADCE, and P_DC in Table 9 challenges this view, as it implies that not all public information about dividends is incorporated by the market. These differences could be caused by market inefficiencies or the presence of other factors influencing investor behavior and, thus, stock prices.

5.4 Summary of Analysis

The findings from the different event windows provide partial support for the semi-strong form of the EMH. The market consistently reacts to DC, which significantly impacts CAR during all event windows. This suggests that dividend announcements provide information about a company's future outlook. However, the lack of statistical significance for ADCE and other variables in certain event windows indicates that the market does not always fully and quickly incorporate all new public information, highlighting potential market inefficiencies.

6. Discussion

This chapter critically evaluates the results, highlighting their implications and relevance. Additionally, it critiques the delimitations, methods, variables, and theoretical framework used in the study. The chapter also reviews the conducted robustness tests, answers the research question, and suggests areas for future research, providing a comprehensive understanding of the study's contributions and potential directions for further investigation.

6.1 Implications of the Findings

The findings of this study show that any of the discrepancies between announced dividends and consensus estimates do not significantly impact the cumulative abnormal return during any of the event windows. This implies that the value of these discrepancies when valuing stocks is negligible when analyzed in combination with dividend changes. These findings could mean that consensus estimates are not valuable or do not accurately reflect market expectations. This may be a result of investors overlooking dividend forecasts by financial analysts or not believing that they can accurately predict future dividends.

The findings indicate that dividend changes, regardless of direction, demonstrate significance across all event windows when analyzed in combination with the discrepancies that show that the information conveyed by dividend changes impacts the market's expectations regarding a company's value. These results align with the signaling theory, indicating that dividends are an important factor when valuing a company, thereby contradicting the dividend irrelevance theory. This could be due to investors separating dividends from total return, as Hartzmark & Solomon (2019) found in their study.

The significance level in CAR1 indicates that the market reacts immediately to dividend changes. Additionally, the significance observed in the other event windows of this study shows that the effect of dividend changes persists for at least 14 trading days following the announcements. These findings highlight the importance of further research to determine the duration of the Swedish stock market's significant reactions to dividend changes.

In the sub-sample analysis of positive dividend changes and negative discrepancies between dividend announcements and consensus estimates, no significance was found in CAR1. This suggests that the market does not immediately incorporate new information into stock prices, potentially due to skepticism about the validity of the signals these variables provide. However, during the following short-term event windows, positive dividend changes showed significance, implying that the market either needed time to fully integrate the new information or to assess whether the signals accurately reflected the company's future outlook. The absence of significance for negative discrepancies indicates that the market does not value this information as highly as positive dividend changes.

The findings also revealed that neither positive dividend changes nor positive discrepancies between announced dividends and consensus estimates showed significance in any of the event windows, suggesting that the market prioritizes other factors. A plausible explanation is that the company's annual report, which is released simultaneously with dividend announcements, provides additional, comprehensive information, including earnings presentations and management's outlook, which may be weighted more heavily by the market. Therefore, even though the models achieved statistical significance, they convey limited economic significance.

Ultimately, this study concludes that dividend changes are a more effective proxy for explaining market reactions than the consensus estimates. The difference in dividends from the previous year significantly impacts cumulative abnormal returns, as opposed to the discrepancies between announced dividends and consensus estimates.

6.2 Critique of Study Design & Data

6.2.1 Sample Selection & Data Quality

The study utilized a robust dataset obtained from LSEG Eikon, focusing on the 60 largest companies on the Swedish stock market. The focus on large-cap companies ensured high-quality and relevant data, as these companies are typically comprehensively analyzed by financial analysts. The extensive coverage of these companies allows for a detailed analysis of the effects of dividend announcements, providing a comprehensive view of the market reactions within a large segment of the Swedish stock market. Additionally, using the largest companies was advantageous since it made the findings more generalizable for the Swedish stock market since they cover a larger market share. This enhances the robustness of the study's findings, making them more applicable to a substantial part of the Swedish stock market.

Furthermore, using LSEG Eikon enhances the reliability of the data due to its reputation for accuracy and comprehensive coverage of financial markets. This ensures that the data used in the study is both current and historically consistent, which is crucial when conducting reliable quantitative analyses and deriving valid conclusions.

However, the lack of transparency regarding the calculation of LSEG Eikon's estimates introduces some uncertainty, raising questions about the quality of the consensus estimates. Despite the inability to obtain the underlying calculations or weights, LSEG Eikon makes sensible assumptions to increase precision, placing additional weight on more recent forecasts from top analysts.

While focusing on the 60 largest companies makes the findings more generalizable for the Swedish stock market, it can also limit the generalizability due to the exclusion of smaller companies. Smaller firms may exhibit different market behaviors and reactions to dividend

announcements due to factors such as lower liquidity, higher volatility, and differing investor bases. By excluding these smaller firms, the study's findings are primarily applicable to large-cap companies, potentially overlooking the unique market dynamics present in small-cap or mid-cap companies.

Despite these limitations, the high quality and relevance of the data from the 60 largest companies provide a solid foundation for understanding the impact on market reactions to dividend announcements.

6.2.2 Temporal Scope

The study's time frame, ranging from January 2020 to May 2024, captures recent market behavior and trends, ensuring that the findings are relevant to current financial contexts. Analyzing data within this time period allows for an examination of how the present market dynamics influence stock price reactions in response to dividend announcements. The chosen period ensures that the findings are applicable to investors and analysts engaged in the current market conditions. However, this time period may not capture long-term market cycles and be influenced by specific economic events, such as the COVID-19 pandemic, which might have a unique impact on the results. Specific events could cause anomalies that do not reflect typical market behavior over longer periods. Additionally, focusing on a shorter time period limits the ability to analyze long-term trends and patterns, which could provide a more comprehensive understanding of the market reactions to dividend announcements.

Despite the limitation of not capturing long-term trends and patterns, the recent time period provides valuable insights into the current market dynamics and investor behaviors, making the findings highly relevant for current financial analysts and investors.

6.2.3 Geographic Scope

By focusing on companies within the Swedish stock market, the study provides in-depth insights into specific market dynamics and investor behavior in Sweden. This targeted approach allows for a thorough analysis of the impact of dividend announcements within a specific context. The Swedish stock market is well-regulated and transparent, ensuring high-quality and reliable data for the study. Additionally, prior research by Berezinets et al. (2019), Alkebäck (1997), and Andres et al. (2013) highlights that different geographical

markets have different reactions to dividend announcements. Therefore, by focusing on a single geographic area, the study is better suited to analyze the unique economic, regulatory, and cultural factors that influence investor behavior in Sweden. However, by only focusing on the Swedish market, the generalizability of the study may be limited in regard to other international markets. Since almost every market has its own unique economic, regulatory, and cultural factors that can influence market reactions and investor behavior. A study of multiple markets may cause difficulties in finding similar results. Thus, focusing on the Swedish market is particularly valuable, as this specific context has not been thoroughly studied before.

6.3 Critique of Methodology

6.3.1 Variable Statistics

To adjust the underlying data for heteroscedasticity, an initial Breusch-Pagan/Cook-Weisberg test was performed to determine if the observed residuals exhibit significant heteroscedasticity. Since this test could not correctly process the data, robust standard errors were used instead. An alternative test that could have been conducted is the White test to detect heteroscedasticity. However, the White test uses a large number of degrees of freedom, which can be problematic in small samples, as in this study.

The use of robust standard errors offers several advantages that make it a better approach for the study. Robust standard errors adjust for heteroscedasticity without requiring any changes to the model specification, preserving the original structure of the data. This method is more simple to implement and interpret, making it ideal for studies with small sample sizes. Additionally, robust standard errors enhance the reliability of the regression results by providing reliable standard errors even when heteroscedasticity is present, ensuring that the statistical assumptions made are robust and reliable. Therefore, the use of robust standard errors is particularly well-suited to this study, balancing simplicity and accuracy.

The decision to use a 90% confidence interval is due to the exploratory research question and purpose. It was also implemented because of the relatively small sample size, aiming to provide a more realistic range of potential results. While the use of higher intervals, such as

the 95% confidence interval, offers greater precision, they can also exclude more results and increase the risk of Type II errors. Therefore, using a 90% confidence interval balances precision with the risk of missing significant findings, laying a solid foundation for future research.

6.3.2 Dependent & Independent Variables

Cumulative abnormal returns are used in event studies to capture and illustrate the effect over event windows, providing concise measures directly applicable to the model. However, using other dependent variables, such as abnormal return or average abnormal return, offers additional insights to interpret the results for each trading day within the event window or the average market reaction within each trading day.

Incorporating additional variables, such as earnings per share surprise, and analyzing different years in clusters, including the pre- and post-COVID-19 periods, could enhance the analysis of the study's chosen variables and provide more comprehensive insights. However, adding these variables could cause multicollinearity regarding earnings per share or introduce biases regarding a variable for COVID-19. Finally, the marginal benefit of adding more variables may diminish over time, contributing less to the explanatory power of the model while complicating the analysis. Therefore, while incorporating these additional variables and time periods can provide further insights, it is crucial to balance these benefits against their risks and challenges to ensure robust and reliable findings. Ultimately, the variables in this study provide clear and interpretable results within the scope of this study.

6.3.3 Robustness Tests and Sub-Sample Analysis

Additional sub-sample and scenario analyses were performed to test the robustness of the initial analyses of the variables within the event windows. The data was divided into sub-samples of positive and negative variables, and then the effects were examined across different event windows, focusing on the impacts of dividend changes in combination with the discrepancies between dividend announcements and consensus estimates. This method highlighted the variability of results across models, indicating that these effects only marginally contribute to the cumulative abnormal return. The use of multiple event windows,

covering 0-14 trading days, captured both immediate and short-term impacts, providing a comprehensive analysis period.

An alternative method could involve using a difference-in-differences (DiD) approach. The DiD method could be used to compare the changes in outcomes over time between companies that announced dividends (treatment group) and companies that did not (control group). While this method controls for unobserved factors that may vary over time, it requires a well-defined control group and assumes that the control group accurately represents what would have happened to the treatment group in the absence of the treatment. This assumption is difficult to meet within the context of the study, particularly due to the volatility of financial markets and the difficulty in finding an appropriate control group due to the differences between companies.

Therefore, the chosen approach of using sub-samples and multiple event windows is advantageous due to its simplicity and interpretability, aligning well with the study's relatively small sample size. It effectively captures short-term impacts and uses robust standard errors to ensure reliable results. While the difference-in-differences method offers some benefits, it also introduces complexities and assumptions that may not fit the study's objectives and general data limitations. Thus, the study's approach provides a balanced, robust, and clear framework for analyzing the market reactions to dividend announcements.

6.4 Critique of the Theoretical Framework

The findings of this study provide partial support for the semi-strong form of the EMH. The consistent market reactions to dividend changes indicate that investors do integrate new information into stock prices, aligning with the semi-strong form of the EMH. However, the inconsistent market reactions to discrepancies between the announced dividends and consensus estimates suggest that new information is not being fully or quickly reflected in stock prices. The partial support of the results from this study implies that while the market is efficient in some aspects, inefficiencies or other factors still affect how new information is incorporated into stock prices.

The signaling theory is also supported by the findings of this study regarding the dividend changes' significant impact on cumulative abnormal returns during the event windows. This

indicates that investors view dividend changes as meaningful signals of a company's future outlook. However, the signaling theory is not supported by the discrepancies between announced dividends and consensus estimates. Furthermore, the dividend irrelevance theory is supported by the lack of significance in the discrepancies between announced dividends and consensus estimates. This suggests potential market inefficiencies or that other factors have a greater influence on cumulative abnormal returns during the event windows. These findings indicate that not all aspects of dividend announcements are valuable for stock price valuation, confirming that dividends may not always be relevant in the context of company valuation.

The study could have implemented alternative theories, such as the agency theory. The agency theory examines the conflicting interests between managers and shareholders, arguing that dividend policies can mitigate agency problems by reducing the available free cash flow to managers, restricting their ability to pursue suboptimal projects. Although this theory provides a foundation for understanding the relationship between corporate governance and dividend policies, it does not focus on the quick market reactions to dividend announcements, which is in line with the purpose of this study.

Even though the study could have implemented the agency theory, the chosen theoretical framework of the EMH and signaling theory provides a better understanding of the findings. These theories are highly relevant to the purpose of the study to examine how new information is incorporated into stock prices. They offer a solid foundation for analyzing market reactions to dividend announcements by understanding the informational role of dividends and market efficiency. The dividend irrelevance theory is valuable for contrasting the findings and examining how dividend announcements may or may not impact stock prices under the study's conditions. This theory especially highlights the potential market inefficiencies and the limited information role of the discrepancies between the announced dividends and consensus estimates.

6.5 Answer to Research Question

This study examined the research question: *"How do dividend changes and the discrepancies between announced dividends and consensus estimates impact stock prices for Swedish companies following dividend announcements?"* The findings concluded that only dividend

changes significantly impact stock prices following dividend announcements. Highlighting the difficulties of isolating market expectations about dividend announcements and how they impact stock prices.

6.6 Suggestions for Further Research

As stated above, this study has been delimited to the 60 largest companies on the Swedish stock market from 2020-2024, analyzing how dividend changes and discrepancies between announced dividends and consensus estimates impact stock prices during the 14 trading days following dividend announcements. Consequently, the study does not account for other factors that could impact stock prices, such as other market dynamics and information leakage before the announcement day. However, it could be interesting to analyze how the following impacts stock prices:

6.5.1 Broader Market Scope

Future researchers could expand the model's scope by including smaller companies and analyzing different geographic markets simultaneously to assess generalizability across various markets. This broader scope could, as previously mentioned, reveal differing results between international markets.

6.5.2 Event Windows

Incorporating additional and varied event windows could further analyze market behavior regarding the chosen variables. Future analyses could include the trading days leading up to the announcement day and explore the effects within an extended event window to capture a wider range of market reactions.

6.5.3 Additional Variables

Adding variables could enhance the explanatory power of the model by incorporating industry-specific factors, economic indicators, and the dividend yield of the analyzed companies. This would provide a more nuanced understanding of the factors influencing stock prices.

Addressing these areas will allow future research to build on this study's findings and provide a more comprehensive understanding of the market dynamics, regarding dividend changes and the discrepancies between announced dividends and consensus estimates impact on stock prices.

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Appendices

Table A1. Not Transformed Variables used within regression analysis

Not Transformed Variables	*N*	*Mean*	*Median*	*Min*	*Max*	*Standard Deviation*	*Skewness*	*Kurtosis*
ADCE	195	-0.0159417	0	-1	0.6469038	0.1782302	-1.899312	13.12543
P_ADCE	97	0.0904915	0.0626819	0.0001562	0.6469038	0.0991428	2.469882	12.29073
N_ADCE	92	-0.129199	-0.0747825	-1	-0.0012399	0.1796989	-3.040553	13.89636
DC	191	0.1901556	0.0909091	-1	9.823529	0.7756574	10.21453	126.1963
P_DC	146	0.2975111	0.1213235	0.012987	9.823529	0.8515196	9.797011	108.9304
N_DC	26	-0.273727	-0.2451117	-1	-0.0041667	0.2200423	-1.512027	5.703368
CAR1	195	0.0031021	0.0022882	-0.1445752	0.20185	0.0517525	0.3817489	4.387817
CAR2	195	0.0030336	0.0017466	-0.138451	0.2348448	0.0634344	0.5125317	3.745326
CAR3	194	0.0050141	0.001808	-0.229467	0.3150982	0.0812129	0.761213	5.347636

Table A2. Error Term for OLS assumption fulfillment

Variable	*Observations*	*Mean*
u	191	1.69e-10

Table A3. Correlation Matrix

Correlation Matrix	*ADCE*	*P_ADCE*	*N_ADCE*	*DC*	*P_DC*	*N_DC*
ADCE	1.0000					
P_ADCE	0.9958	1.0000				
N_ADCE	0.9729	n/a	1.0000			
DC	0.1620	0.1917	0.0731	1.0000		
P_DC	0.1851	0.2215	0.1604	0.9778	1.0000	
N_DC	-0.2930	0.0099	-0.5280	0.8080	n/a	1.0000

Table A4. Compiled Company List

Ticker Name	Company Number
ATCOA.ST	1
INVEB.ST	2
VOLVB.ST	3
EQTAB.ST	4
ASSAB.ST	5
SEBA.ST	6
HEXAB.ST	7
SAND.ST	8
EVOG.ST	9
EPIRA.ST	10
ALFA.ST	11
ESSITYB.ST	12
SHBA.ST	13
ERICB.ST	14
SAABB.ST	16
LIFCOB.ST	17
SCAB.ST	18
SKFB.ST	19
TELIA.ST	20
BOL.ST	21
INDT.ST	22
NIBEB.ST	23
TRELB.ST	24
SKAB.ST	25
BEIJB.ST	26
AAK.ST	27
TEL2B.ST	28
HOLMB.ST	29
SECUB.ST	30
GETIB.ST	31
HUSQB.ST	32
SWECB.ST	33
HPOLB.ST	34
AVANZ.ST	35
MYCR.ST	36
FNOX.ST	37
LAGRB.ST	38
THULE.ST	39
WIHL.ST	40