



**SHORT- AND LONG-TERM PERFORMANCE CHANGES AFTER CEO
ROTATION: EVIDENCE FROM NASDAQ HELSINKI**

Lappeenranta–Lahti University of Technology LUT

Bachelor thesis in Business Analytics

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Examiner: Post-doctoral researcher Timo Leivo

ABSTRACT

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SHORT- AND LONG-TERM PERFORMANCE CHANGES AFTER CEO ROTATION: EVIDENCE FROM NASDAQ HELSINKI

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The role of the CEO is presumably one of the most visible in the modern corporate world, and the rotation of the CEO causes significant attention in the media as well as between investor communities. This study focused on examining the short- and long-term performance changes caused by the CEO rotation. In the study, the short-term performance changes were measured in terms of abnormal stock market reactions, while the long-term performance changes were examined by observing the selected accounting metrics through the 7 years around the change. In addition, the study aimed to separate whether the performance changes vary depending on the CEO's origin. The study focused on Nasdaq Helsinki companies, and the selected samples were CEO changes between 1.1.2011 - 31.12.2019.

The study results indicate that the change was beneficial for shareholders in terms of short- and long-term performance. Through the event period [-10, +10] the cumulative average abnormal returns were +6,10 % which indicates investors' positive approach to change. The long-term performance examination indicated peer-group controlled ROA to increase by +3,08 % and ROE by +3,20 %, which indicates the increased capability to serve the company's and shareholders' wealth. Additionally, the study found differences depending on the successor's origin. Referring to the findings of the study, the outside successors caused a higher positive average abnormal stock return, while the long-term performance examination indicated that insider successors managed to deliver better results in terms of ROA and ROE.

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LYHYEN- JA PITKÄN AIKAVÄLIN SUORITUSKYVYN MUUTOKSET TOIMITUSJOHTAJAN VAIHDON JÄLKEEN: NÄYTTÖÄ NASDAQ HELSINGIN YHTIÖISTÄ

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Toimitusjohtajan rooli on yksi näkyvimmistä modernissa yritysmaailmassa, ja toimitusjohtajan vaihto aiheuttaa merkittävää huomiota niin mediassa kuin myös sijoittajayhteisöissä. Tämä tutkimus keskittyi tutkimaan toimitusjohtajavaihdoksen aiheuttamia suorituskyvyn muutoksia niin lyhyellä- kuin myös pitkällä aikavälillä. Tutkimuksessa lyhyen aikavälin suorituskykyä mitataan osakemarkkinoiden reaktioiden kautta, kun taas pitkän aikavälin muutosten tarkastelu suoritetaan vertailemalla valittuja taloudellisia tunnuslukuja läpi muutosajan. Lisäksi tutkimus pyrkii erottelamaan, mikäli suorituskyvyn muutokset eroavat riippuen siitä onko valittu toimitusjohtaja valittu yrityksen sisältä tai ulkopuolelta. Tutkimus keskittyy Helsingin pörssin yhtiöihin ja valitut otokset ovat toimitusjohtajavaihdoksia aikavälillä 1.1.2011 – 31.12.2019.

Tutkimuksen tulokset osoittavat muutoksen olleen positiivinen niin osakemarkkinoiden reaktion kuin myös pidemmän aikavälin tunnuslukutarkastelun perusteella. Läpi tarkastelujakson [-10, +10] kumulatiiviset keskimääräiset epänormaalit tuotot olivat +6,10 %, joka indikoi sijoittajien positiivisesta suhtautumisesta muutokseen. Tunnusluvuiksi valikoituneet vertailuryhmäkorjatut ROA ja ROE puolestaan kasvoivat läpi muutoksen keskimäärin 3,08 % ja 3,20 %, joka indikoi parantunutta pitkän aikavälin taloudellista suorituskykyä. Lisäksi tutkimuksessa löydettiin eroja suorituskyvyn muutoksista sisäisten sekä ulkoisten jatkajien välillä. Tuloksiin nojaten, osakemarkkinat tuottivat korkeammat keskimääräiset epänormaalit tuotot jatkajan ollessa ulkopuolinen rekrytointi, kun taas pidemmän aikavälin tarkastelussa sisäiset hakijat näyttivät onnistuneen paremmin palvelemaan yrityksen- sekä osakkeenomistajien varallisuutta.

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1 Introduction

The Chief Executive Officer, shortly known as the CEO, is presumably the most visible person in the company's public image, and especially media often associates the company's success with the CEO's performance. By simplifying, the CEO's main task is to maximize the economic output with given resources. (Kontes, 2010). In other words, the CEO is the key driver of company strategy, and finding a knowledgeable and company-accredited CEO is essential for the company's success (Carpenter 2000). Through this, the changes of CEO cause a significant attention in media as well as between investors communities. This thesis will examine how the CEO change has influenced company's short-term performance in terms of stock market reactions, and furthermore, how company's long-term performance varies through the change.

Especially in the last years, the debate around "the CEO effect" has intensified, referring to the increased power and publicity of the CEO. Regarding the term, Quigley and Hambrick (2015) found evidence that the responsibilities of CEOs' have increased in the last decades, highlighting the strategic point of view regarding the CEOs in the office. At the same time, during the 2000th century, the CEO's role has become more demanding, leading to a higher number of turnovers (Kaplan & Minton, 2012). In Finnish publicly held companies, the CEO's average tenure is under five years (Ylemmät toimihenkilöt, 2019). The prior evidence indicates that firms with poor financial performance are more likely to announce a CEO departure, which emphasises the strategic importance of the CEO in the office. (Dahya, Lonie & Power, 1998; Dedman & Lin, 2002) Additionally, it is good to notice that the CEO departure is not always forced, as leaders may leave the company due to retirement, resigning, death, or due to a new task (Eugene & Karan, 1990).

If looking the CEO departure announcements from the stock market's perspective, the change can cause a wide range of interpretations that appear in the short-term stock market reactions. Firstly, the departure may cause significant human resource loss that may affect crucially in the expectations of future performance. On the other hand, the departure may signal about the latent difficulties, such as a lack of capability to retain a good CEO.

(Dedman & Lin 2002) From another angle, replacing a CEO might help with a fresh start when implementing a new company strategy that enables a new rise (Weng & Lin, 2014).

The academic field has not found clear consensus on the CEO transition effects, neither regarding the short-term market reactions or nor in the changes of long-term performance. The prior studies about investors' reactions evidence diversifying approach to CEO change, as the market reactions have been found positive, negative, and neutral. Dedman and Lin (2002) as well as Beatty and Zajac (1987), evidenced negative market reactions, while positive market reactions were evidenced by Huson, Malatesta and Parrino (2004). In addition, many studies found neutral market reactions to the announcements (Reinganum 1985). As market reaction should reflect the investors' expectations of company's future performance, the missing consensus studies might indicate on challenges setting the equal meters. This viewpoint is supported by review article of Furtado's and Karan's (1990) that found the reaction to depend on multiple variables such as successor's origin, stock ownership or the company size.

The prior studies regarding the long-term accounting performance change were firstly evidenced by Lieberman and O'Connor (1972), who stated that macroeconomic and organizational variables had a greater impact on performance progress than leadership change. Despite that, a major part of the variance of profit margins was explained by leadership change, while the effect on earnings and sales was significantly lower. Huson, et. al. (2004) examined the performance after the CEO change and found the leader rotation favorable in terms of yield of capital. Additionally, the study examined the performance by separating the departures to two subgroups, voluntary and involuntary, and found a higher positive reaction and a clear decrease on performance before forced CEO dismiss. The similar results were evidenced by Rhim, Peluchette, and Song (2006), which however, found a general improvement in many financial metrics, including earnings and sales.

The prior study field has its own limitations which narrows the possibility of generalizing the issues prior addressed. For example, in the examination of market reactions, Dedman and Lin (2002) evidenced that some prior studies drop the samples where other relevant information is published near the CEO departure announcement, as other studies do not

control this kind of confounding information. This can lead to a big difference between the studies, as the market reaction can be seen as an outcome of all the information that markets reflect. Dedman's and Lin's (2002) study supports this viewpoint by exploring neutral reaction to announcements where a successor was named simultaneously, while a declining reaction was evidenced after the announcement of permanent successor. The other propounding aspect is the CEO's origin, as the market reactions as well as the future performance have been found to differ depending on whether the CEO is coming from inside or outside the company (Huson, Malatesta & Parrino, 2004; Rhim, Peluchette & Song, 2006).

Noteworthy is also to notice that prior studies are mostly based in the United States or other bigger markets, and therefore, the results of this thesis may differ from the previous literature. Finnish, as the Nordic markets as a whole, may not be fully comparable with the USA as the ownership of Nordic companies is more centralized and includes more institutional investors. This leads to more powerful stakeholders, and more centralized decision-making. In addition, there are differences in corporate governance, which can also make a difference to company structure and on the information that the markets reflect. (Weimer & Pape, 1999) According to the author's knowledge, no previous literature examines this matter regarding Finnish companies.

1.1 Research aims and questions

This thesis aims to explore the short- and long-term performance changes after the CEO rotation in the Nasdaq Helsinki companies between years 2011 – 2019. The short-term performance is examined by stock market reactions, which indicates immediate changes in stockholders' wealth after the CEO change. The long-term performance examination aims to explore how the companies' capability to deliver results has changed through the CEO rotation. Thus, to assemble the aims and the study context, this thesis will examine whether the market reacts positively, negatively, or neutrally to the CEO change announcement, and after that, reveal the accounting performance metrics three years prior and three years after the CEO change.

To broaden the current field of study, this thesis will examine whether the stock market reaction and future performance is depended on the CEO's history with the firm. This scrutiny originates from previous studies, which have found differentiates in future performance depending on the CEO's experience with the company (Zhang & Rajagopalan, 2010). For this purpose, incoming CEOs are classified whether they come inside or outside the company. This study is limiting its samples to cases where the departing CEO and successor is named simultaneously, as therefore the market reaction can be seen as outcome of CEO change effect, with minimum amount of uncertainty left. In addition, this enables trustful and equal comparison of the financial results, as the examination time is identically specified.

To sum up the proceeding, the aim of the study is summarized into one main study question and into one sub-question. The main study question was defined as follows:

How did the CEO change impact the company's short- and long-term performance?

While the sub-question was defined as follows:

How did the short- and long- term performance changes vary depending on the origin of the incoming CEO?

1.2 Structure of the thesis

This thesis is structured by the following: After the introduction, the used framework and themes are presented in Chapter 2. The aim of the chapter is to give a basis understanding of frameworks used in the study, which is essential for understand the examinations made in the empirical section. After that, chapter 3 will introduce the data as well as the used methodology. Chapter 3 will represent the used data and its limitations, as well as introduce the methodologies used in the study. Chapter 4 will introduce the empirical results, after which, the conclusions and need for future study is discussed in the Chapter 5.

2 Theoretical framework

This section will summarize the framework, which is essential to understand before exploring the empirical study and its results. The chapter will introduce CEO's position in Finnish context, as well as describe the role of the CEO and expected outcomes when rotating CEO in the office. After that, the Efficient market hypothesis and Capital Asset Pricing Model is presented, which plays a crucial role further in the event study methodology. In the last and second-last sections, the selected accounting metrics are presented as well as the prior research regarding the CEO transition effects.

2.1 The framework of CEO position in the Finland

To further understand the CEO's role and the stock markets reactions, it is paramount to understand the legislative circumstances where Finnish companies and their CEO's operate. Regarding Nasdaq Helsinki's (2019) general rules, the stock market participants commit to fair securities market practices, which serves the efficient markets where all participants have equal access to the information and where the price of the security is based on unbiased and trustful information. Through these practices, all relevant information that could affect the position of the stock, should be informed to the public as soon as possible and inside information should be published at latest when revealing it to analysts or stock owners. More specifically, Nasdaq's rules directly order changes in top management to be published in the markets, and the top management announcement should include the incomer's previous experiences and competencies. This kind of information is, for example, previous work experience and relevant education.

The legal environment may differ significantly between different regions, and therefore there may be some distinctive features that may affect the position of the CEO. The Finnish Companies Act (Osakemarkkinalaki, 624/2006, 7 chapter 17 §) defines the CEO's general tasks as "running the company's daily operations under general juridical power, giving the board of management the needed information, taking responses for the accounting, and

taking care of the reserve management”. Regarding YTN (2019), in the Finnish law environment, the CEO is not in a direct employment relationship with the company, so the CEO’s tenure can be determined with immediate execution. The same logic goes also as opposite; without a separate agreement, the CEO is able to switch the position without further delay. Thus, even though the law has zero period of notice, separate agreement can limit the rights and freedoms regarding these matters.

2.2 The role of the CEO

The CEO acts a crucial role in the corporate world due to their comprehensive and multidimensional role, which Kontes (2010) aptly summarizes as “to ensure that all resources of the company are committed to strategies that maximize the growth of economic profits over time”. The role not only requires a steep understanding of the company’s financials but also requires personnel knowledge to maximize the output of the human resources in the company (Kontes, 2010). This has not always been the situation, as still in the 1950s, CEOs were in a position where the amount of responsibility was significantly lower, firings were rare, and the salaries did not significantly differ from other top management (Quigley & Hambrick, 2015). Beyond that, especially in the 2000th century, the CEO role has become significantly challenging, which has led to higher salaries, increased responsibilities, and shorter tenures. Therefore, CEOs handle their responsibilities in a more vulnerable role which is strictly monitored by investors and the board of directors. (Kaplan & Minton, 2012; Quigley & Hambrick, 2015)

From the perspective of stockholders, the company's success is strongly personified with the CEO, which however, is relatively natural when considering the current responsibilities (Kontes, 2010). By fundamental, the CEOs are in charge of company strategy as well as current and future performance, and meanwhile, the CEO’s performance is constantly evaluated by the board of directors. Therefore, the positioning of the CEO is one of the company’s internal control mechanisms, and moreover, it is used when aiming for a better CEO-firm match and/or higher future performance. (Bae & Joo, 2021) In addition, also the stock markets, directly or indirectly, can be seen to evaluate and monitor the tenure of the CEO (Bloom & Jackson, 2016). Regarding this, many prior studies have evidenced that the

rotation of the CEO is often preceded by poor financial performance and decreasing share price, and in these situations, the incoming CEO is expected to take immediate actions to reverse the direction of the company (Dahya, Lonie & Power, 1998; DENIS & DENIS, 1995; Huson, Malatesta & Parrino, 2004). Furthermore, it is also good to note that CEO departure is not always associated with the company's situation, as the CEO may leave due to a new job, retirement, or health-related issues (Eugene & Karan, 1990).

In the modern corporate world, the time lag between CEO changes has decreased through the 2000th century and is already under five years in Finnish companies (Quigley & Hambrick, 2015; YTN, 2019). Depending on the individual situation, some underlying factors, such as the length of the CEO tenure and the origin of the incoming CEO, might affect crucially when considering the CEO change. Referring to length of tenure, Weng and Lin (2009) state that long-tenured CEOs are less likely to learn new and broaden their point of view, while "fresh" CEOs are more motivated to expand their perspective and open-mindedly challenge the old status quo, even though, the long-tenured CEOs were admitted having accumulated industry-specific knowledge which is challenging to achieve. Weng and Lin (2009) support their viewpoint of decreased strategic changes by Gabarro's (1987) study, according to which most of the strategic changes in companies are made within 2 ½ years from the CEO's appointment. However, the pros and cons of increased CEO tenure can be seen to be sector-specific, which was evidenced by Henderson, Miller, and Hambrick (2006), as they found longer CEO tenure to be beneficial in the stable branded food industry, while in the dynamic computer industry, increased tenure affected negatively into the company's performance.

As previously mentioned, the CEO's capabilities are evidenced to differ depending on their origin and history with the firm. According to Chung et. al. (1987), inside CEOs are more aware of market conditions, customers, and firms' employees, and they have already built networks that might give crucial help when performing their job. Schepker et. al (2017) see this background to culminate into a skill of leveraging all the current resources with little strategic change, which in general, can be an expensive process for a company. From another angle, the faster start of work reduces the transition costs, which however, should not be considered as a decision-making factor if the benefit of the change exceeds the costs (Bae & Joo, 2021). By simplifying, the inside successors can be seen as beneficial when a board of

directors has a strong belief in the current strategy and when no fundamental transformations are needed (Weng & Lin, 2009).

While the inside successors were seen to deliver value through their accumulated industry- and personnel knowledge, outside coming CEOs might bring an advantage by broader insight gained from other companies, especially when implementing strategic changes. Furthermore, if the outsider has specific industry experience, it may help crucially with the incomer's learning curve. (Chung et al., 1987) In addition, Chung et. al (1987) considered the difference from the human point of view, by reflecting on whether the insider's affection for the company might prevent them from making critical decisions, whereas the outgoing CEO may look at the overall situation in a more objectively, due to lack of emotional attachments. Therefore, to simplify, outside successors can be seen to bring an advantage when the company aims to change its direction through high-level strategic change, while inside successors are seen to bring stability and continuousness with low-level transition costs (Schepker et. al, 2017). Nevertheless, these insights are simplifications from reality, and the real pros and cons may vary significantly depending on the individual leader and company.

To further examine short-term performance changes caused by the CEO change, prior literature has built frameworks that are also advantaged in this study. Pessarossi and Weill (2013) examined CEO turnover affects in China, and introduced framework that includes three hypotheses that explains the market reaction. To start with scapegoat hypothesis, it predicts no abnormal stock returns, as no CEO is fungible and could be replaced by equal candidate. Even though the CEO could be dismissed, questioned option only exists to give motivation for the CEO to put his or her best effort. In this case, as every candidate is equally qualified, markets should not see any difference between the leaders, and therefore no stock market reaction should exist. (Pessarossi & Weill, 2013)

The second hypothesis is the ability hypothesis, where every leader has their own abilities and skillsets. In this case, the CEO coming into the company is expected to outperform the departing CEO with his or her skillset, and therefore change is only made to a better option.

When rotating to a more suitable CEO, also company's performance is expected to increase, and abnormal stock returns are expected to be positive. (Pessarossi & Weill, 2013)

Third option is information hypothesis, where the departure of the CEO indicates management's poor decisions regarding the CEO in the office, which have not already reached the investors. This is due to asymmetric information between the board of directors and investors. In this case, the board of management is already aware of poorly performing CEO, but markets receive negative news at that very moment, which leads to negative reactions and therefore to negative abnormal stock returns. (Pessarossi & Weill, 2013)

2.3 The Efficient Market Hypothesis

The Efficient Market Hypothesis was famously represented by Fama (1970) which reached a significant position in the academic literature. Fama (1970) defined a capital market as a mechanism that serves efficient capital resource allocation, and in an optimal case, markets give accurate signals about changes in the position of the asset. Definitionally efficient markets mean circumstances where markets are constantly reflecting all the possible information, and therefore, no inefficiency should exist in the market (Fama, 1970). Imitating the Knüpfer and Puttonen (2018), the markets' reflection of receiving information is presented in Figure 1.

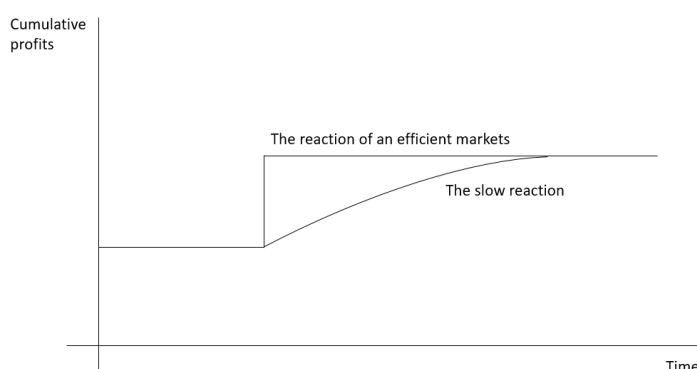


Figure 1. The market's reflection of information. (Referring: Knüpfer & Puttonen, 2018)

The efficient market hypothesis is based on the theory that all the relevant news occurs rapidly and is incorporated into the stock prices with immediate response (Malkiel, 2003). This is due to the belief that even though all the investors do not have access to the same information, there are numerous investors who seek greater wealth, and thus, competition takes care that inefficiencies are rapidly cleared from the markets. Therefore, all the information is already included in the price of an asset, and investors should not be able to find “undervalued” stocks. (Lo, Lo & MacKinlay, 2011; Malkiel, 2003) By this background, the hypothesis strongly presumes that it should be impossible to beat the market in the long run, as a randomly selected portfolio of stocks (with the same risk level) should offer the same profit as any else investment strategy (Malkiel, 2003). Previous academic literature has diverse opinions about the matter. Malkiel (2003) supports the hypothesis by looking at the performance of investment managers, as most of them could not beat the profit of the stock portfolios based on the overall indexes.

The efficient market theory is strongly associated with another hypothesis, a random walk. The random walk hypothesis assumes that all the information is independent of each other, and that today’s news is not affecting stock prices tomorrow. In other words, the information shown today is reflected in the prices already today, and markets do not have memory that could affect the day after. Through this background, it should be impossible to predict the future by looking at previous stock behaviour. Also, upcoming news is seen as unpredictable and random, which leads to a situation where no investor is in an advantageous position in the markets, and therefore cannot enjoy greater profits through biased information. (Malkiel, 2003)

When examining market efficiency, Fama (1970) found it challenging to test whether markets fully reflect the incoming information. To get the relevant information from the study, three assumptions were made. Firstly, trading the stocks is made without transaction costs. Secondly, all available information is available to all individuals operating in the market, and thirdly, all participants share common implications about the effect on price from received news. Fama (1970) also divided the market efficiency conditions into three different subgroups: weak, - semi-strong-, and strong form. The information available in each form is described in Figure 2.

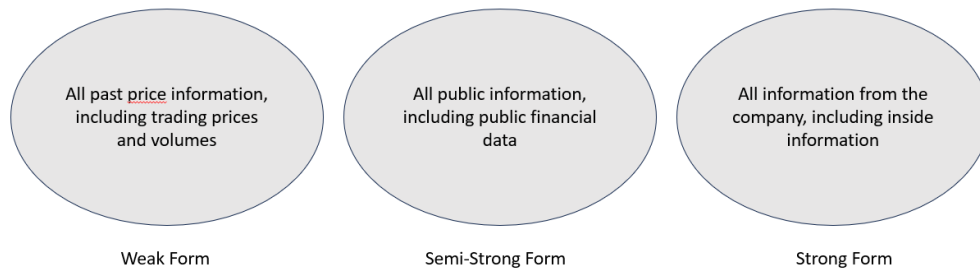


Figure 2. Definitions of efficiency market forms.

The weak form present a circumstance where investors have all the available information on historical prices. Studies prior to Fama's (1970), are mostly made with this assumption and they are strongly associated with the hypothesis of random walk. In these conditions, investors could not leverage historical stock performance when trying to accomplish abnormal stock returns. This excludes, for example, the use of technical analysis when trying to outperform the markets. (Fama, 1970)

In semi-strong form, markets have all public information from the company's financial performance, including public financial results. In these cases, the stock prices are expected to be rated at the right level as investors reflect the information by the same implications, and thus, information is already reflected correctly in the stock price. Therefore, the fundamental analysis would not help with achieving abnormal stock returns as all the financial statement information is public. (Fama, 1970; Knüpfer & Puttonen, 2018)

In the strong market forms, prices reflect all available information, which also includes the information inside the company. In these conditions, all participants have equal access to any information, and no individual could benefit from their monopolistic information. Especially this is a difficult circumstance to achieve in the real world, and Fama (1970) recognizes it as only a theoretical description of reality. This is due to the challenge of biased information distribution, as individuals working inside or close to the company many times hold information that could be leveraged when investing in the company. (Fama, 1970)

Criticism towards efficient market theory has been presented through the decades after Fama's (1970) ideas of efficient market theory. According to Malkiel (2003), during the twenty-first century, beliefs that markets are fully unpredictable have been questioned and

opposite contributions have been represented. According to the same study, critics have been directed especially to the three background defaults of the study. For example, transaction costs truly exist in the real-life world, and investors may not have the same access to the information.

A spread belief nowadays is that markets are at least partially predictable, which is, for example, explained by irrational behaviour of the investors (Malkiel, 2003). To support the claim of irrational behaviour, Malkiel (2003) examines the previous stock bubbles, where stock prices have increased tremendously without significant change in the economic environment. Even though this kind of mispricing might sometimes occur, the effective market mechanism is seen to repair itself, thanks to the greedy profit-seeking active investors. Therefore, relying on this theory, markets tend to eliminate their own weaknesses. To sum up, even though markets are not perfect, they are still able to operate efficiently. (Knüpfer & Puttonen, 2018)

2.4 Capital Asset Pricing Model

The origin of the famous CAPM model comes from Markowitz's (1952) study which covered the topics of Modern Portfolio Theory. Sharpe (1964), Lintner (1965), and Mossin (1966) revised the model in their studies, which are seen as a crucial milestone in the development of CAPM. Through these implications, one of the most famous pricing models was developed and it is still broadly used in many economic applications. (Fama & French, 2004)

The basic idea of the CAPM is to offer a simple one-factor capital asset model that considers the relation between risk and expected return (Elton, 2011). Despite the effectiveness and generalizability of the model, it has faced a lot of criticism for its inadequacy and unrealistic restrictions (Fama & French, 2004). Firstly, it is essential to understand the model's restrictions, which Elton (2011) presents as follows:

1. Investors are able to buy and sell stocks without transaction costs

2. It is possible to invest with any amount of money, so buying a fraction of stock is possible (for example, 1/3 part of one stock)
3. Individuals on the market have been released from paying income taxes
4. Any individual is not able to affect the price of the stock through their own buying or selling actions
5. Investors make decisions about their portfolio only based in terms of expected values and standard deviations
6. Short selling is possible without any restrictions
7. Any individual is capable of lending and borrowing money at a riskless rate
8. Investors share the exact same investment horizon, and they are only interested in the mean and variance of returns
9. Investors have the same profit expectations
10. All assets are suitable for use in the markets

By simplifying the model, CAPM offers a stock's expected return considering a riskless interest rate added with a risk premium of individual stock. In the CAPM model, most of the investors are supposed to hold a well-diversified portfolio, and therefore unsystematic risk goes close to zero and only systematic risk is under consideration. (Elton, 2011) The significance of systematic risk is measured with a beta multiplier, which describes the sensitivity of the stock compared to the market portfolio. As the market portfolio holds a beta value of 1, a beta lower than one (<1) barrier a lower risk than the market portfolio. With the same logic, a beta higher than one (>1), includes more risk than market portfolio. (Fama & French, 2004) To clarify, a case where stocks beta has value of 0.5, a 10 percent decrease in the market portfolio will decrease the individual stock (or portfolio) by 5 percent. On the other end, a beta 0 will describe a totally riskless investment. (Fama & French, 2004) The formula of the beta is as follows:

$$\beta_i = \frac{Cov(R_i, R_m)}{Var(R_m)} \quad (1)$$

where, $R_i =$ The return of the stock, $R_m =$ The return of the market portfolio.

The overall formula of the CAPM is found in the Equation 2. The formula includes a risk-free interest rate, which is commonly benchmarked by a bond that carries little or no default risk, for example, a US government bond (Morgan Stanley, 2013).

$$\bar{R}_i = \bar{R}_f + \beta_i (\bar{R}_m - R_f) \quad (2)$$

where, \bar{R}_i = The expected return, R_f = The risk – free interest rate, β_i = The beta of the security, \bar{R}_m = The return of the market portfolio.

Other remarkable key figure from the CAPM model is as called Jensen's measure (Alpha). The Jensen's' measure was introduced by Michael Jensen in 1968, and its function is to measure the return over or under prediction given by CAPM. In finance world, alpha is many times used to measure the investment managers performance compared to market performance (Bodie, Kane & Marcus, 2005) The alpha's formula requires predictions of alpha and market return, and predicts alpha as following:

$$a_p = \bar{R}_p - [\bar{\beta}_p (\bar{R}_m - R_f)] \quad (3)$$

where, a_p = The alpha, \bar{R}_p = The return of the portfolio, $\bar{\beta}_p$ = The beta, \bar{R}_m = The return of the market portfolio, R_f = The risk-free interest rate

2.5 The performance measures

This study will use ROE and ROA to measure the long-term performance of the company. The ROE (Return on Equity) offers valuable information how a company can serve the shareholders' wealth. By general, ROE indicates the return for stockholders' capital, or in other words, how well stockholders' equity generates into profits. (Jones, 2007) The formula of the ROE is as following:

$$ROE = \frac{\text{Net income}}{\text{Stockholders' equity}} \quad (4)$$

ROA (Return on Asset) shares the same numerator with ROE but differs from its distributor, and thus, it offers another angle in examination of company performance. The main intention of ROA is to indicate how well company can generate profits to serve its overall assets, as the net income is compared against the total assets of the company (Jones, 2007). The formula of the ROA is expressed as follows:

$$ROA = \frac{Net\ income}{Total\ Assets} \quad (5)$$

These metrics are considered to offer comprehensive outlook of the changes in the company performance, especially when compared together and against peer groups from the same industry. Nevertheless, they still got their own limitations that should be considered. Firstly, as ROE focuses only on stakeholders' equity, it is prone to balance sheet manipulation in order to increase the value of the metric. (Trainer 2018) As ROA takes the current liabilities into account, the additional debt and risk level increases the distributor of the equation, and therefore, decreases the value if profits are not rising at the same level. However, some prior studies evidence significant changes in company's total assets around the CEO change, which naturally affects the value of the ROA (DENIS & DENIS, 1995). Secondly, neither the net income are not immune for the manipulation, as it is a subtraction of profits after the expenses, and therefore, it could be influenced by the company management. (Barber & Lyon 1996; Jones, 2007)

2.6 Prior literature on CEO transition effects

The success of the CEO change is an extensively researched topic in the academic field, but nevertheless, the field lacks consensus on the transition effects. To start with the short-term stock market reactions, Pessarossi and Weill (2013) examined the short-term performance changes using a sample size of 1155 and focusing on companies that operated in Chinese markets between the years 2002 – 2010. The study found stock markets to react with a positive approach, and moreover, markets were seen to prematurely increase their expectations which was evidenced by premature positive reactions. The contrary perceptions have been presented by Dedman and Lin (2002) who studied the market reactions in the UK markets during the years 1990 – 1995, using a sample size of 251. The study found a

significantly negative overall reaction from the markets, but as an exception, the markets were found to react neutrally if the incoming leader was announced simultaneously. This finding speaks in behalf that the investors did not see dramatic changes as long as the new leader was informed, but when the investors were left with uncertainty, a negative approach existed. Additionally, the study found the market reaction to be the most negative when no other news was announced close to the CEO's departure announcement.

Huson et. al (2004) broaden the study field by examining both short- and long-term performance changes. Their sample included 1344 CEO changes of large firms in the United States and the study found a positive approach from the markets which indicates increased expectations of future performance. More precisely, the study found higher abnormal returns when the CEO was departure was forced, and in these situations, the study found investors to reply with higher expectations when the successors were outsiders. If considering the forced CEO change as an indication of underlying problems, the higher positive reaction strengthens the assumption that investors believed in outsiders' capability to implement the needed high-level changes in the company. The study also examined the long-term accounting performance with OROA and OROE (operating income-based metric) and found an increase in the peer-group controlled long-term performance. In addition, the study found outside successors to outperform inside successors in terms of long-term operating performance, but nevertheless, that examination did not achieve statistical significance in their regression analysis. Despite the parallel short- and long-term performance changes, it is good to note that short-term examination was implemented with 1344 CEO changes, while the long-term performance change was examined by sample size of 1002, and hence, the difference may narrow the possibility of generalizing the stock markets capability to predict the outcome of the change.

A similar study was also made by Denis and Denis (1995) who used a sample size of 908 and focused on companies operating in the United States between 1985 – 1988. Denis and Denis found that in the companies that end up rotating their CEO, the cumulative abnormal returns (CAR) were significantly negative during the preceding 250 days (CAR – 14.3 %), and even higher when the CEO departure was forced. The study focused on exploring the market reactions on the event date as the following date, and found positive reactions, especially when the departure was forced. The declining performance was also evidenced in

other examined metrics, as companies were found to downsize their number of employees, capital expenditures, and total assets prior to top management change. The top management rotation was evidenced successful when considering the increased operating-income-based accounting performance (OIBD/TA) through the surrounding 7-year period. The increase in performance was at its highest when the CEO was forced to leave, which draws a picture of successful change in terms of stockholders' wealth.

Another similar study has been presented by Rhim, Peluchette, and Song (2006), who examined long- and short-performance changes, and additionally, changes depending on the incoming CEO's origin. Their original sample included 211 changes, and based on the prior 3-year average ROE, 136 of them were classified as "good" performing, and 71 as "poor" performing, while the rest of the samples were not included in long-term performance examination due to a lack of accounting information. In general, the stock market reactions were evidenced positive, and higher reactions were found when the company was classified as "poor" performing, even though this comparison did not achieve statistical significance. The long-term performance examination found the change to be beneficial in a wide range of financial- and operational- metrics, and additionally, a statistically significant increase was evidenced in debt ratio, which indicates a more aggressive approach in the company's financing (Rhim et. al, 2006). Considering the long-term performance changes, the study found inside successors to outperform the outside successors both in pre-and post-succession periods, which was seen to indicate smoother transition when the successor was insider.

3 Data and methodology

This section introduces the data used in the study, the limitations of sample selection and the used event- and accounting study methodology. The event study is used with an aim to examine the short-term performance through abnormal stock returns, while accounting study aims for exploring the long-term financial performance. The event study uses a market model as an estimation method, which is a linear model closely united with the approach of the CAPM (Castro-Iragorri, 2019).

3.1 Data

The events of this study are collected from the Nasdaq database, and the selected companies were all publicly listed companies in the Nasdaq Helsinki between 2011 and 2019. The examination period was defined as such for two reasons: relatively stable market conditions and a lack of global crises that could bias the results. The announcements were searched from the database with the keyword “CEO”, which was mentioned in the headline or in the body text. Referring to database structure, the CEO departure announcement was found in the categories of “Changes in board/management/audit” and “Inside information”, which were both selected when finding the events. The final sample was divided into two parts, inside- and outside successors. Outside successors are individuals coming from outside the company, and inside successors are firms’ current employees, including the firm's board of management.

When reviewing searches with the mentioned criteria, the sample included 146 announcements. As this study strictly focuses on examining the market reaction after the CEO change, the sample was limited to announcements where departing and incoming CEOs were announced at the same time. Therefore, the study excluded 66 samples where only a permanent CEO was announced. In this way, markets were seen to reflect information regarding the CEO’s change effect, and therefore, less uncertainty should exist in the market reaction. With the same criteria, cases that had any tangled information, such as other financial announcements, were excluded from the sample events. After this definition, the

sample used in the event study included 30 cases, which had 10 inside-, and 20 outside successors. The sample used in the event study is defined in Table 1:

Table 1. The sample data of event study.

The overall count of CEO changes	146
<i>Permanent CEO announcements</i>	66
<i>Tangled information</i>	34
<i>Financial announcements</i>	16
Accepted CEO announcements	30
Inside successor	10
Outside successor	20

Due to missing or inadequate information, six samples had to be removed for the accounting study. Also, one sample company had to be removed due to significantly outlier values (ROE under – 2000 %). This was not observed as a contradictory matter in the terms of the study, as 23 samples were seen to offer relatively reliable outlook of the performance changes, even though this limits the opportunity of drawing equal conclusions between event- and accounting studies. After this reduction, the sample data of the accounting study was defined as follows:

Table 2. The sample data of accounting study.

The overall count of CEO changes	146
<i>Permanent CEO announcements</i>	66
<i>Tangled information</i>	34
<i>Financial announcements</i>	16
<i>Missing, inadequate or outlier information</i>	7
Accepted CEO announcements	23
Inside successor	5
Outside successor	18

The stock market data, as well as the accounting and financial data, was taken from the Refinitiv database. For the stock market examination, the OMX Helsinki Cap GI-index was selected for the benchmark index, as it offers a good outlook of stock performance of Nasdaq

Helsinki. The Helsinki Cap GI-index is a weight-restricted yield index, that has limitation of 10 percent for individual share, and therefore, it is the trustworthy outlook of the market. As seen in Figure 3, stock markets have gone through stable increases in the selected period, without long-lasting decrease periods.



Figure 3. The OMX Helsinki Cap GI 2011 – 2018.

3.2 The event study methodology

The event study methodology is broadly used in economic study, and its first implications were presumably presented by Dolley (1933) when examining stock splits and their effects on stock price. After that, especially from the 1930s to the 1960s, the model progressed through various studies, and a currently used version of the study methodology has been presented by Ball and Brown (1968), and Fama et. al. (1969) in their seminal studies. This study mostly follows MacKinlay's (1997) and Vaihekoski's (2004; 2022) academically well noted versions of the event study. Adapting to these approaches, the course of the methodology follows as following:



Figure 4. The phases of event study methodology. (Referring: MacKinlay, 1997)

The event study starts by defining the event date and defining the estimation- and event windows. The estimation window is used in examining the expected returns, and it should be long enough to indicate only the market volatility and exclude the result of the event. Therefore, the estimation window is defined prior to the start of the event window. An event window instead exists to measure abnormal stock returns between some periods, and hence, possible premature and postmature price reactions to information. (MacKinlay, 1997) The length of the mentioned windows varies, but similarly to Beatty and Zajac (1987), this study uses the event window period of 10 days prior and 10 days after $[-10, 10]$. According to Vaihekoski (2004), the estimation window is commonly defined as 250 days prior, which is the case also in this study. The event- and estimation periods are presented in Figure 5:

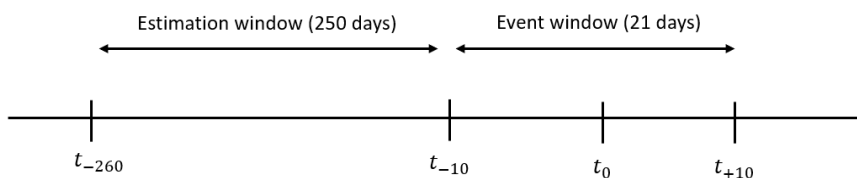


Figure 5. The estimation- and event window periods.

After selecting the periods, the abnormal returns are being calculated through an actual and expected return. By the general terms, the study's mission is to indicate how the stock's price reacts to the given information, and subsequently, the calculation is distinction between actual and expected returns (Vaihekoski, 2022). The formula for calculating abnormal returns is as follows:

$$AR_{it} = R_{it} - E(R_{it}) \quad (6)$$

where, with the company i and time t , AR_{it} is the abnormal return, R_{it} is the actual return, and $E(R_{it})$ is expected return. According to MacKinlay (1997), the returns can be estimated with various estimation methods, such as the constant mean return model, market model, and factor model. This study approaches the estimation of returns with the market model, based on Mackinlay's (1997) and Castro-Iragorri's (2019) findings on the market model's accuracy and broad use in financial studies.

Referring to Vaihekoski's (2004) recommendation, actual returns are measured by a logarithmic calculation. The calculation is done with stocks' daily closing prices, by the following formula:

$$R_{it} = \ln \left(\frac{P_{it}}{P_{it-1}} \right) \quad (7)$$

where R_{it} is the expected return of company i and time t , P_{it} is the stock's i closing price in time t , and P_{it-1} is the stock's i closing price at time $t-1$. After calculation of the actual return, returns are benefitted for the estimation of beta and alpha, which are needed in the estimation of expected return. The estimations of alpha and beta are done by market model as follows:

$$R_{it} = a_i + \beta_i R_{mt} + e_{it} \quad (8)$$

where R_i is the actual return, a_i is alpha of the security, β_i is beta of the security, R_{mt} is the market return, and ε_{it} is the error term. The model estimates the alpha and beta by using the ordinary least squares (OLS) regression analysis, with a selected estimation window of 250 days. The definitions for alpha and beta are found in the Chapter 2.5.2.

After that, the expected return is calculated to indicate the predicted return which is not influenced by this specific event (Vaihekoski, 2022). The expected return over the estimation period can be estimated as follows:

$$E(R_{it}) = a_i + \beta_i R_{mt} + e_{it} \quad (9)$$

Where $E(R_{it})$ is the expected return, R_i is the actual return, a_i is alpha of the security, β_i is beta of the security, R_{mt} is the market return, and ε_{it} is the error term. Referring to assumptions of the model, the error term ε_{it} has a value of zero, and therefore, it vanishes from the formula (MacKinlay, 1997). Through this, the formula of abnormal stock returns is presented as follows:

$$AR_{it} = R_{it} - (a_i + \beta_i R_{mt}) \quad (10)$$

To draw an overall view of the reactions on a specific date, the average abnormal return (AAR) is calculated. AAR aggregates all reactions and results to an average value, which allows the analysis of reactions on each specific date (MacKinlay, 1997). The formula of the AAR is as follows:

$$AAR_t = \frac{1}{n} \sum_{t=1}^n AR_{it} \quad (11)$$

Where AAR_t is the average abnormal return in time t, n is the number of events and AR_{it} is the abnormal stock returns in company i and time t. The cumulative abnormal return (CAR) is calculated to examine the aggregated reactions through a given period. With CAR, it is possible to reduce the effect of individual stock, which increases the generality of the study. (MacKinlay, 1997) The formula of CAR is defined as:

$$CAR_i(t_1, t_2) = \sum_{t_1}^{t_2} AR_{it} \quad (12)$$

Where CAR is the cumulative abnormal return of company i between periods t1 and t2. To broaden the outlook of this, also cumulative average abnormal return (CAAR) is calculated in the study. CAAR gives an average effect between some periods, for example, one day prior to and after the event date. The formula of the CAAR is as follows:

$$CAAR_i(t_1, t_2) = \frac{1}{n} \sum_{t_1}^{t_2} CAR_{it}(t_1, t_2) \quad (13)$$

where CAAR is the cumulative average abnormal return in company i between periods t_1 and t_2 , n is the number of events, and CAR is the cumulative abnormal return of company i between periods t_1 and 2 .

3.2.1 Statistical testing

The significance of the event study was observed with t-test methodology, based on Armitage's (1995) findings on the t-test's robust usability in event study methodology. Firstly, under examination is a null hypothesis according to which individual event does not affect the price of the security, or in other words, the reaction does not differ from zero. Referring Vaihekoski's (2022) approach, the formula for testing whether AAR differs from zero is following:

$$t_{AAR_t} = \frac{\sqrt{N} \times AAR_t}{\sqrt{\sigma^2 (AR_{it})}} \sim N(0, 1) \quad (14)$$

Where $\sigma^2 (AR_{it})$ is the variance of abnormal returns in time of i . The null hypothesis is examined also regarding CAAR, to indicate whether reaction differs from zero in longer period. The statistical significance of CAAR can be examined as follows:

$$J_1 = \frac{CAAR_t}{\sqrt{\sigma^2 (t_1, t_2)}} \sim N(0, 1) \quad (15)$$

where $\sigma^2 (t_1, t_2)$ is the variance in the period between t_1 and 2 , and it can be defined as:

$$\sigma^2 (t_1, t_2) = \frac{1}{N^2} \sum_{i=1}^N (t_2 - t_1 + 1) \sigma^2 (t_1, t_2) \quad (16)$$

3.2.2 Problems of event study methodology

Even though a significant amount of academic study is made with event study methodology, it has its own weaknesses which are vital to notice. First, the exact event date is hard to determine accurately, and it is often evaluated by the researcher (Vaihekoski, 2022) This

study tries to minimize this effect by choosing only the events where all information (incoming and departing CEO) is announced at the same time, and therefore, the event date is not very interpretive. But still, the information can reach the markets before the announcement, for example cases where incoming CEO is coming from other company and his or her departure is announced in advance, and therefore, the flow of information is not symmetric (MacKinlay, 1997)

Event study also assumes individual events to be separate from each other, which is not always the case in the real-life world. Even though the restriction of this study tries to eliminate duplicate announcements, the flow of information about the companies is constant, and separating the impact of each event is arduous. Additionally, the assumptions expect the events to be exogenic, which excludes the cases where the event is a consequence of the price change. (Vaihekoski, 2022) As the majority of this study's announcements were presented with the fore sentence "CEO leaving in common agreement", it is fairly to question does this assumption holds, or whether the price development affects the decision to rotate the CEO.

One another assumption of the model is constant beta, which is the consequence of calculating beta through an estimation period. In contrary to this, Armitage (1995) argues about discrepancy in beta between event and estimation period, which was supported by Krueger's and Johnson's (1985) study that found variance and beta to be higher in dividend announcement day and day after. As beta is an estimation of market total risk, it can also be affected by macroeconomic conditions, which may change crucially in such a long horizon, and current state of total risk may not be fully involved when using beta for predicting future values (Wells, 2004).

3.3 The account study methodology

The accounting study is used to offer long-term insight into a company's performance before and after the CEO change. Many previous studies, such as Huson et. al. (2003) as well as Denis and Denis (1995), evaluate the company performance through accounting metrics, using comprehensive key figures. By fundamental, these metrics are selected to explore the

comprehensive performance progress. The results are also observed independently, but to draw an extensive outlook of the relative company success, the results are reduced from peer groups' equivalent, after which, the reliability of the results is evaluated (Barber & Lyon, 1996) The framework presented and used in this study closely adapts the well-noted version of Barben's and Lyon's (1996).

The examination of the performance starts by selecting the used metrics, peer groups, and time windows. Similar to Huson et. al (2003), this study will use ROA and ROE as accounting performance metrics, but unlike Huson et. al, this study uses net income instead of operating income. Since the net income includes all expenses and incomes, not only the operating-related financial items, the study results may vary from the prior studies. Despite this, ROA and ROE were used in the study due to their broad use and easy approachability. After selecting the used metrics, the time windows are defined. The year of the departure was defined as $t = 0$, which divides the time window into pre-departure- and post-departure periods. The pre-departure period was defined as three years prior to the change, and the post-departure period was defined as three years after the change, similar to many prior studies (Barber & Lyon, 1996; DENIS & DENIS, 1995; Huson, Malatesta & Parrino, 2004; Rhim, Peluchette & Song, 2006). The selected overall time window of 7 years was considered to draw an extensive outlook of the changes in performance.

The peer group was defined similarly to Barber's and Lyon's (1996) framework, by using industry and performance-related variables. More precisely, the search was made by using a two-digit GICS code, that offers similar-kind classification for the companies in different regions (MSCI, 2023). According to Rhim et. al. (2006), a two-digit system is precise enough to offer precise classification, and also, rough enough to ensure the variety of the results. After finding the companies with the matching GICS codes, the performance was considered. To find companies with similar performance, this study searches companies whose ROA and ROE (at time $t-1$) are in the 90 – 110 % range compared to the sample company. The search time was selected as such due to its common use, and also, as it was the last full year when the departing CEO was in charge. Therefore, the peer group companies operate in the same industry (in terms of two-digit SIC) and had nearby ROA's and ROE's year before the CEO was changed.

To get the benchmark comparison level (expected performance) for the examination, the mean of the ROAs and ROEs are calculated in each peer group. The mean value was selected as a benchmark metric due to its broad use in academic literature, as well as Barber's and Lyon's (1996) findings on its suitability in this kind of study. These calculated metrics produce an estimation of expected performance, or in other words, a metric of how companies with the same point of departure have managed to perform. To explore how the company's performance differs, the company's performance is subtracted from the expected performance. After defining the peer group-controlled company performance, the final step is to calculate the performance change with the following formula:

$$\Delta Performance = Performance_{post} - Performance_{pre} \quad (17)$$

Where $\Delta Performance$ is the change of the performance through the time period, while $Performance_{past}$ and $Performance_{pre}$ are the peer-group controlled performance values. The process of determining the pre-turnover- and post-turnover performances is presented in Figure 6:

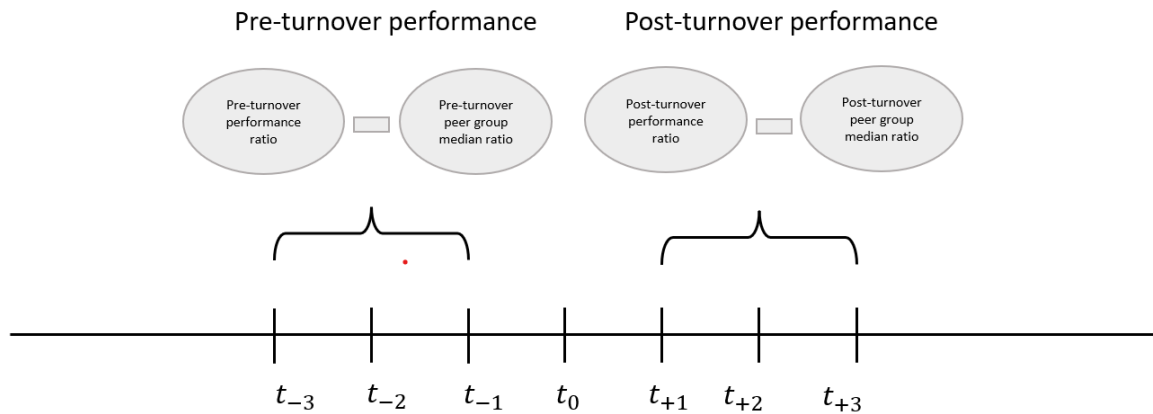


Figure 6. Performance changes.

Furthermore, to examine whether insider and outside successors managed to deliver better results, samples are categorized into two subgroups depending on the CEO's origin (inside or outside). After categorization, the performances are compared with each other to examine whether other subgroups have delivered more favorable results.

3.3.1 Statistical testing

In general, the statistical significance is estimated to confirm the reliability of the results and it can be estimated through various methods. In the closely related study of Barber's and Lyon's (1996), the nonparametric Wilcoxon signed-rank test outperformed t-statistics in terms of statistical significance, and therefore, it was selected as the most suitable option in this study. The benefits of the method are its modest requirements, as it also allows the use of abnormally distributed data, and therefore offers a more reliable picture considering the relatively small sample size (Barber & Lyon, 1996). The null hypothesis of the study is that the median abnormal performance is zero, or in other words, the company's performance does not significantly differentiate from the peer groups' equivalent. The z-statistics is estimated with the following formula:

$$z - statistics = \frac{W - \left(\frac{n(n+1)}{4}\right)}{\sqrt{\frac{n(n+1)(2n+1)}{24}}} \quad (18)$$

Where n is the sample size and W is the absolute value of differences in observations between the two samples.

4 Empirical results

This section represents the empirical findings of the study, which are further used when discussing the conclusions and need for the future study. The section starts by examining the immediate stock market reactions which indicates the short-term performance of sample companies. After reviewing the market reactions, the long-term performance is examined through selected accounting metrics. Additionally, in both sections, the differences are examined between the inside and outside successors.

4.1 The short-term performance

Table 3. The overall abnormal returns.

The abnormal returns - inside and outside successors (N = 30)

Days	AAR	t-ratio	p-value
-10	-0,24 %	-0,48	0,636
-9	1,10 %**	2,15	0,040
-8	1,04 %**	2,05	0,050
-7	1,22 %**	2,39	0,023
-6	-0,16 %	-0,32	0,750
-5	-1,00 %*	-1,96	0,059
-4	-0,25 %	-0,48	0,632
-3	0,87 %*	1,71	0,097
-2	0,18 %	0,36	0,724
-1	0,29 %	0,57	0,574
0	0,19 %	0,36	0,719
1	0,52 %	1,02	0,316
2	0,57 %	1,12	0,270
3	0,26 %	0,52	0,608
4	0,01 %	0,01	0,989
5	0,70 %	1,37	0,181
6	0,54 %	1,05	0,301
7	0,43 %	0,85	0,404
8	-0,19 %	-0,37	0,713
9	-0,38 %	-0,74	0,465
10	0,39 %	0,77	0,447

*** significant at 1 % risk level

** significant at 5 % risk level

* significant at 10 % risk level

The abnormal returns from the whole sample are presented in Table 3. As seen, statistically significant results are found in the time before the announcement, as event dates -9, -8, and -7 returned statistically significant results with a 5 % risk level. By increasing the risk level to 10 %, event dates -5 and -3 returned statistically significant results. The event date itself caused only a small movement (+ 0,19%), which is, referring to statistical significance, explained by normal market movement. Noteworthy about the results is the time before the announcement, as days -9, -8, and -7 returned clearly positive abnormal returns (> 1%), while each day after the announcement caused returns without statistical significance, and therefore, they are more of a return of random market movement. To illustrate the results, abnormal returns are presented in Figure 7.

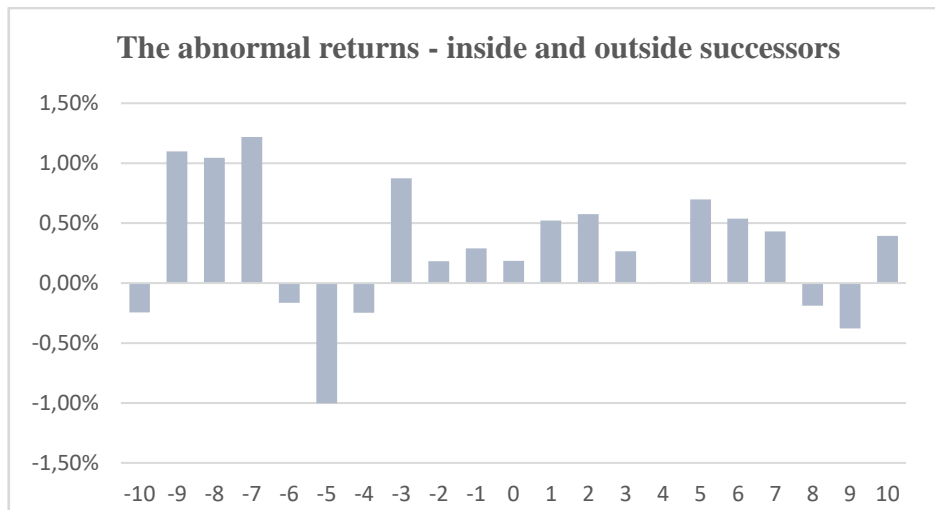


Figure 7. The abnormal returns – Inside and outside successors.

As Figure 7 indicates, the investors seemed to react with a positive response to the CEO change, but especially from the dates after the announcement date, results are poorly statistically significant which reduces the reliability of the results. When examining the full sample, poorly significant results are not a big surprise, as the results are a collection of two very different types of announcements. Also, the individual date can include a lot of randomness in the price factors, and these cannot be taken under consideration by the model. Through this, the AAR is understandably tangled which affects the generalizability of the estimations. Noteworthy from the results is that the information appeared to reach the markets nine days [-9] before, after which markets needed roughly one week to consider the

value effect of change. This kind of market movement indicates about leak of information, which is expectedly biasedly distributed among the investors.

Table 4. The study results of overall group.

[t1,t2]	CAAR	Varianssi	J1	p-value
[-10,-1]	3,05 %**	0,000261	1,89	0,029
[-5,-1]	0,10 %	0,000130	0,09	0,466
[-1,+1]	1,00 %	0,000130	0,87	0,191
[0,0]	0,19 %	0,000026	0,36	0,358
[0,+1]	0,71 %	0,000052	0,98	0,164
[+1,+5]	2,07 %**	0,000130	1,81	0,035
[+1,+10]	2,86 %**	0,000261	1,77	0,038

*** significant at 1 % risk level

** significant at 5 % risk level

* significant at 10 % risk level

Table 4 presents aggregated reactions through seven different periods. In this examination, periods of [-10, -1], [+1, +5], and [+1, 10] produced statistically significant results which are all positive and above 2 %. A conspicuous aspect of the findings is that in all time frames, the market reacts with a positive response, which draws a positive overall approach to CEO changes. The neutral and statistically non-significant reaction on the event date instead indicates investors' knowledge regarding the incoming news, as the news did not manage to surprise the markets. The postmature positive reaction gives a signal about an optimistic approach to change, as markets seemed to believe a positive effect on the company's performance. The approach is analogous to Pessarossi's and Weill's (2013) ability hypothesis, according to which companies change the CEO if the new leader is believed to outperform the old leader, and therefore, the market reacts with a positive response. The Pessarossi's and Weill's hypothesis is presented in the Chapter 2.3

4.1.1 Outside and inside successors

Table 5. The subgroup results.

Inside successor (N = 10)				Outside successor (N = 20)			
Days	AAR	t-ratio	p-value	Days	AAR	t-ratio	p-value
-10	-0,87 %	-2,46	0,020**	-10	0,07 %	0,18	0,8601
-9	2,40 %	6,82	0,000***	-9	0,34 %	0,90	0,3765
-8	2,95 %	8,37	0,000***	-8	-0,19 %	-0,50	0,6215
-7	1,04 %	2,96	0,006***	-7	1,21 %	3,17	0,0035**
-6	-0,41 %	-1,17	0,253	-6	-0,01 %	-0,02	0,9874
-5	-1,38 %	-3,91	0,000***	-5	-0,73 %	-1,90	0,0676*
-4	-1,05 %	-2,97	0,006***	-4	0,17 %	0,44	0,6652
-3	0,79 %	2,25	0,032**	-3	0,90 %	2,34	0,0261**
-2	-0,91 %	-2,57	0,015**	-2	0,87 %	2,27	0,0303**
-1	-0,39 %	-1,11	0,275	-1	0,65 %	1,70	0,1002
0	1,51 %	4,28	0,000***	0	-0,57 %	-1,50	0,1442
1	-0,22 %	-0,64	0,529	1	0,80 %	2,09	0,0449
2	1,43 %	4,06	0,000***	2	0,21 %	0,56	0,5793
3	0,47 %	1,34	0,190	3	0,18 %	0,46	0,6487
4	-1,33 %	-3,77	0,001***	4	0,74 %	1,94	0,0612**
5	0,76 %	2,14	0,040**	5	0,59 %	1,54	0,1330
6	0,20 %	0,57	0,575	6	0,63 %	1,65	0,1090
7	0,54 %	1,54	0,135	7	0,37 %	0,96	0,3463
8	-0,91 %	-2,58	0,015**	8	0,25 %	0,66	0,5163
9	-0,44 %	-1,24	0,223	9	-0,32 %	-0,84	0,4065
10	0,57 %	1,62	0,116	10	0,29 %	0,76	0,4541

*** significant at 1 % risk level

** significant at 5 % risk level

* significant at 10 % risk level

The results of the subgroup examination differentiated from the overall examination, which draws an interesting result between these two subgroups. To start with a subgroup of inside successors, the examination narrates mostly significant AAR values, which state about increased reliability of results. Especially in the time before the announcement, results are strongly statistically significant, and therefore, the reaction differs from zero. The subgroup of outside successors reached significance on three event dates [-2, -3, -7] with a risk level of 5 %, and on two event dates [-5, 4] with a 10 % risk level. Comparing this table to Table 3 presented in Chapter 4.1, market reactions are more clearly explained by the given event,

or in other words, the reactions are less clearly a consequence of the stock market's randomness. In this context is still good to notice the sample size, which goes below Vaihekoski's (2004) recommendation of a minimum sample size of 30, which may affect to generality of this study, especially in the subgroup of inside successors.

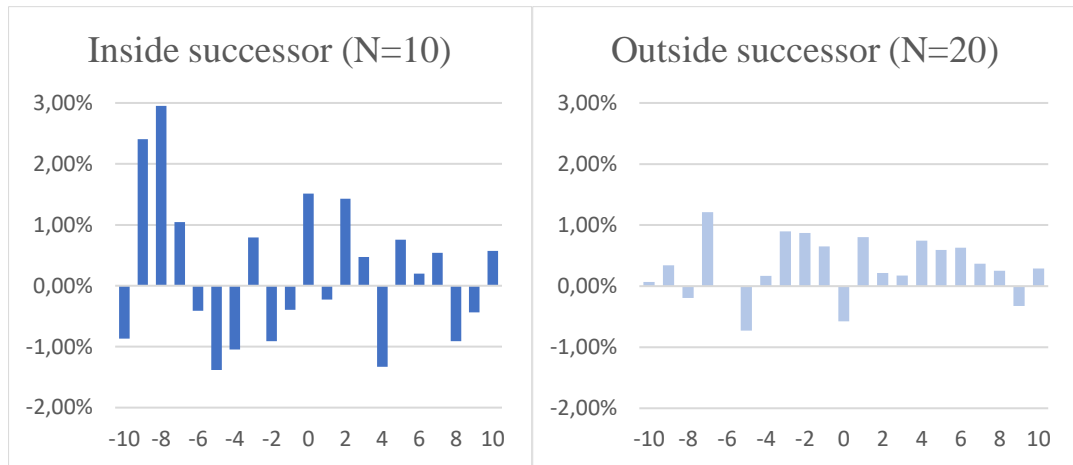


Figure 8. Comparing AAR between inside and outside successors.

Figure 8 draws a picture of the difference between the two subgroups. In both groups, the reaction was positive approximately one week [-7 days] before the announcement, but after that, abnormal returns caused dispersion throughout the period. When the companies with an outside successor caused relatively stable positive reactions, the inside successor's subgroup experienced 10 days of negative abnormal returns and 11 days of positive abnormal returns, including much higher volatility in the value. As the abnormal returns vary widely throughout the period, CAAR gives a better signal of the overall approach to change.

Table 6. Study results of inside and outside successors.

Inside successor					Outside successor				
[t1,t2]	CAAR	Variance	J1	p-value	[t1,t2]	CAAR	Variance	J1	p-value
	2,19								
[-10,-1]	%**	0,000124	1,96	0,025**	[-10,-1]	3,28 %**	0,00015	2,71	0,003**
	-2,93		-	0,000**					
[-5,-1]	%***	0,000062	3,72	*	[-5,-1]	1,86 %**	0,00007	2,17	0,015**
[-1,+1]	0,89 %	0,000062	1,13	0,128	[-1,+1]	0,88 %	0,00007	1,02	0,153
	1,51			0,000**				-	
[0,0]	%***	0,000012	4,28	*	[0,0]	-0,57 %*	0,00001	1,50	0,067*
	1,29								
[0,+1]	%**	0,000025	2,58	0,005**	[0,+1]	0,23 %	0,00003	0,42	0,337
	1,11					2,53			0,002**
[+1,+5]	%*	0,000062	1,40	0,080*	[+1,+5]	%***	0,00007	2,95	*
[+1,+10]									0,001**
	1,07 %	0,000124	0,96	0,168	[+1,+10]	3,74 %	0,00015	3,09	*

*** significant at 1 % risk level

** significant at 5 % risk level

* significant at 10 % risk level

Cumulated average results in both subgroups returned mostly statistically significant results as 10 of the 14 selected examinations reached significance on a maximum risk level of 10 %. When looking at the reaction in the timeframe of [-1, 10], both groups indicated a positive reaction, with a slightly higher value in the group of inside successors. Instead, the timeframe of [-5, -1] seemed to cause differentiated reactions, but bearing in mind the sample size, timeframe [-10, -1] was seen to offer a more reliable picture of the overall reaction. The interesting finding was the reaction in the event date, as the inside successor subgroup experienced positive 1,51 % abnormal returns, while the outside successor subgroup experienced -0.57 % negative abnormal returns. When looking at the postmature reaction with a longer time horizon [+1, +10], the inside successor subgroup experienced +1,07 % positive reaction, while the outside successor subgroup experienced higher +3,74 % abnormal returns. The CAAR throughout the whole event period [-10, 10] is presented in Figure 9, which indicates +6.45 % positive cumulated reaction in the subgroup of outside successor, while inside successor subgroup experienced positive cumulated reaction of +4.77 %.

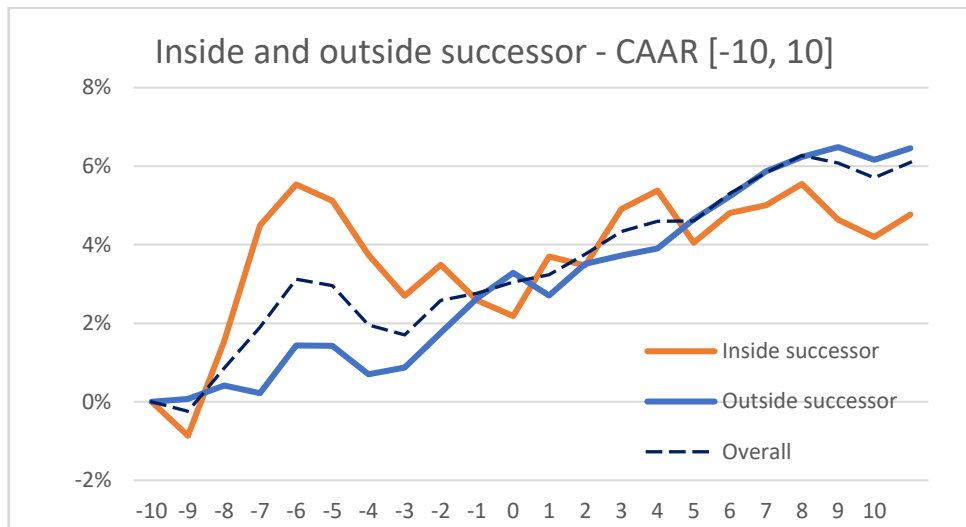


Figure 9. Comparing AAR between inside and outside successors.

4.2 The long-term performance

This section examines the long-term performance change around the CEO rotation, using ROA and ROE as indicative accounting metrics. This section aims to examine the possible change in the company's performance after the CEO change, and furthermore, examine whether another subgroup has managed to deliver better results.

The conclusions made in this study are mostly based on the peer-group controlled results, due to its high significance in the study of Barber and Lyon (1996). In addition to that, the non-adjusted accounting performance metrics are shortly presented. When examining the non-adjusted accounting metrics, it is noteworthy to note that even though absolute values differ, it does not indicate how the company's performance changes when compared to general market conditions (Barber & Lyon, 1996). Table 7 below summarizes the results of the non-adjusted accounting performance.

Table 7. The non-adjusted accounting performance.

Non- adjusted accounting performance - prior- and post-departure		
	ROE	ROA
-3	7,71 %	6,63 %
-2	9,07 %	5,00 %
-1	8,36 %	3,43 %
0	6,18 %	4,03 %
1	8,13 %	6,00 %
2	6,84 %	5,39 %
3	7,86 %	6,26 %

Table 7 indicates the non-adjusted ROA's and ROE's, which are seen to progress slightly into different directions. As the table indicates, the ROE increased from $t = -3$ to $t = -1$, while the ROA evidenced decrease through the same period, while on the contrary, the ROE evidenced decrease from $t = 1$ to $t = 3$, while ROA increased through the same period. Considering that incoming CEO's presumably start their tasks already along the year $t = 0$, no immediate improvements are evidenced in the change from $t = -1$ to $t = 0$. But, even though absolute values may differ, this does not specify whether the companies have managed to perform the investors' wealth better than their comparable peer companies. To start by visualising the peer-group adjusted results, Figure 10 is presented as follows:

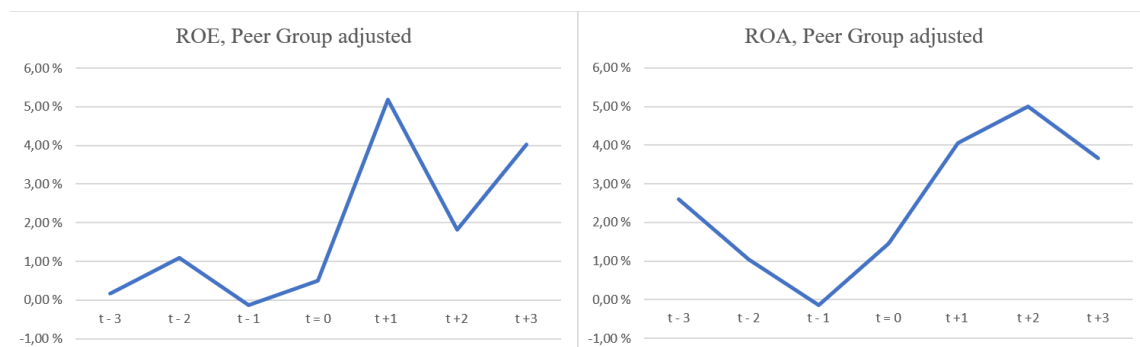


Figure 10. Peer-group controlled ROE and ROA.

As stated in section 3.3, the peer group-controlled results indicate the value that is under or over the expected value, or in other words, it is a value where a company's performance is reduced by the peer-group's mean performance. Figure 10 indicates that in the pre-departure period, the sample companies are operating with ROEs and ROAs that are slightly above the

peer groups' equivalent, except for average-below values in $t = -1$ and positive ROA in $t = -3$. If examining the values of the ROE in the pre-departure period, it can be stated that the sample firms have offered similar shareholders equity value with their peer companies. On the other hand, the ROA was higher at time $t = -3$, but declined through the pre-departure period, indicating a decreased return for the total assets. The course of the ROA is consistent with Huson et. al. (2003), even though it is not fully comparable due to different income metrics. Also, the Denis and Denis (1995) found similar ROA patterns in their study, but which were also observed by operating income-based metric.

Table 8. Examination on changes of ROA and ROE.

Examination on changes of ROA and ROE			
	-3 and -1	-1 and +1	-1 and +3
Industry-adjusted ROE	-0,33 %	5,32% *	4,15 % *
Industry-adjusted ROA	-2,74 %	4,21% **	3,81 % *

* significant at 10 % risk level
 ** significant at 5 % risk level
 *** significant at 1 % risk level

Table 8 indicates an increase in both metrics between the periods of $t = -1$ and $t = 1$. Additionally, these observations were both statistically significant (5% and 10% risk level), which reinforces the assumption of increased performance after the change. As seen, the results between the $t = -1$ and $t = 3$ evidence positive and significant results at 10 % risk level. If looking the pre-departure values [-3 and -1], the progress of ROA was clearly negative (-2,74 %) while ROE decreased only by 0,33 %. As both metrics share the same numerator in the formula, the differentiate could become visible due to changed capital structure, or in other words, decreased stockholder equity or increased liabilities. This is supported by Table 7 of non-adjusted performances, which evidence increase in ROE and decrease in ROA during that same period. However, it is still good to notice that these metrics are relative to the company's capital structure, and for example, in a company that has a lot of liabilities, the decrease in net income affects much strongly in ROE than ROA, as the numerator is relatively much smaller.

Table 9. Peer group adjusted accounting performances.

Peer Group adjusted accounting performances - prior- and post-departure							
	-3	-2	-1	0	1	2	3
Industry-adjusted ROE	0,17 %	1,10 %	-0,13 %	0,50 %	5,19 %	1,81 %	4,02 %
Industry-adjusted ROA	2,60 %	1,05 %	-0,14 %	1,45 %	4,06 %	4,99 %	3,66 %
			Δ Performance	Z-value			p-value
Industry-adjusted ROE			3,20 %	0,6387			0,3253
Industry-adjusted ROA			3,08 %	1,0341			0,2337
* significant at 10 % risk level							
** significant at 5 % risk level							
*** significant at 1 % risk level							

Table 9 specifies the performance values in each individual year, and more importantly, offers a total change of the selected, peer-group controlled metrics. As defined in the section 3.3, Δ Performance indicates the mean change from the pre-departure period to post-departure period. Therefore, the CEO change caused 3,20 % positive increase in terms of ROE and 3,08 % increase in terms of ROA, and hence, the CEO change seems to cause a positive progress when the performance is judged through these metrics. The findings speak behalf of CEO's increased capability to deliver positive results, and additionally, offers evidence that markets succeeded to predict the positive progress in the market reaction. Nevertheless, the test results failed to achieve statistical significance (p-values 0,33 / 0,23), which reduces the credibility and generalizability of the results.

4.2.1 Outside and inside successors

Table 10. Non-adjusted accounting performance by subgroups.

Non- adjusted accounting performance - prior- and post-departure				
	ROE		ROA	
	Inside successor	Outside successor	Inside successor	Outside successor
-3	3,55 %	8,93 %	6,18 %	6,76 %
-2	0,29 %	11,50 %	-0,88 %	6,63 %
-1	-1,19 %	11,01 %	-3,49 %	5,36 %
0	2,88 %	7,10 %	4,92 %	3,79 %
1	2,20 %	9,78 %	3,32 %	6,75 %
2	1,55 %	8,31 %	2,49 %	6,19 %
3	1,10 %	9,73 %	1,23 %	7,66 %
Mean performance [-3, -1]	0,88 %	10,48 %	0,60 %	6,25 %
Mean performance [1, 3]	1,62 %	9,27 %	2,35 %	6,87 %

Table 10 summarizes the non-adjusted, absolute values of ROE and ROA during the examination period. As previously noted, due to their industry affiliation, these metrics offer only an indicative outlook, but even though, a few key findings were found interesting. Firstly, during the pre-departure period, in the outsider's subgroup, the ROE was increasing, while in the insider's subgroup, the value experienced a clear decrease. On the contrary, the value of the ROA shared the same course in both subgroups, as the value decreased each year during the pre-departure period. Noteworthy in this review, as also in general, is the relatively small sample size (N = 5) in the inside successor subgroup, and therefore, the focus should be directed toward the long-time progress and average values. By looking at the bottom lines of Table 10, it can be stated that the average metrics were not directed at the same point before and after the CEO change. As follows, the comparable peer-group controlled results are visualized in the Figure 11.

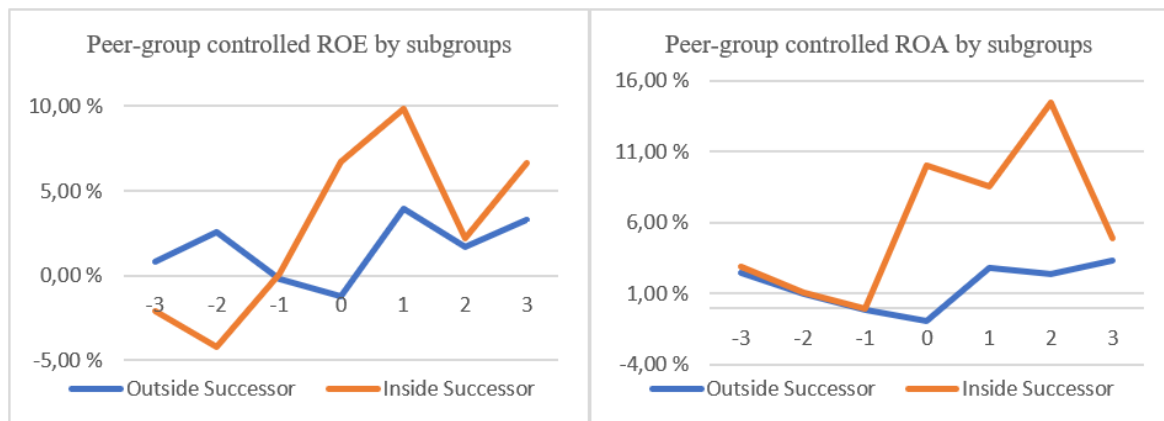


Figure 11. Peer group controlled ROA and ROE by subgroups.

Figure 11 indicates differences between the subgroups, and especially, if observing the exact years in the figure, a clear disparity can be stated. Considering the performance progress through Figure 13, the CEO change was seen as more beneficial in the companies that recruited inside successors. The surprising result was that in the company with an inside successor, the ROE started to increase starting from $t = -2$, while the outsider companies turned the course starting from $t = 0$. In this consideration, the capital structure and random deviation of results may strongly affect the results, especially if a sample company was mostly operating with current liabilities. However, also the ROA experienced a higher increase when the CEO was selected inside the company, which emphasizes the perception of better success of this subgroup.

Table 11. Accounting performance examination by subgroups.

Accounting performance - prior- and post-departure				
	ROE		ROA	
	Inside successor	Outside successor	Inside successor	Outside successor
-3 and -1	2,12 %	-1,01 %	-2,97 %	-2,67 %
-1 and +1	9,76 %	4,09 %	8,55 %	3% **
-1 and +3	6,62 %	3,48 %*	4,89 %	3,51 %
ΔPerformance	8,29 % *	1,78 %	3,79 %	1,74 %
Z-value	-1,7529	-0,3266	-0,9439	-0,3702
p-value	0,0858	0,3782	0,2555	0,3725

* significant at 10 % risk level

** significant at 5 % risk level

*** significant at 1 % risk level

Table 11 summarizes the examination of the subgroup comparison. As seen, in both subgroups, ROA decreased through the pre-departure period, and in the outside successor subgroup, also the ROE decreased during the pre-departure period. From the metrics presented in the upper panel, only two (marked with stars) were able to achieve statistical significance. As previously mentioned, Δ Performance indicates the mean change through the CEO rotation, and in this examination, the results favor the inside successors. More precisely, in the companies with inside successors, the ROE increased by 8,29 % (significant at a 10 % risk level) and the ROA by 3,79 %, even though the result did not achieve statistical significance. In the subgroup of outside successor, the metric growth was more moderate, as the ROE increased by 1,78 % and ROA by 1,74 %.

4.3 The reliability of the results

This study has its' limitations, especially due to the low number of events included. The overall examination reached Vaihekoski's (2004) recommendation of 30 sample events, but the comparison between the subgroups had to be implemented with a smaller number of events (10 and 20). As the data search was made through a manual search, it is possible that the search dismissed some potential events, which was not seen as an issue due to the randomness of the search. On the contrary, the exacting filter in the search phase ensured that the companies of this study had announced only the CEO change announcement, and the possibility of missing overlapping information was relatively low. This does not still exclude the other announcements in other channels or biased inside information in the markets. Additionally, it is good to notice that the accounting study was implemented with reduced data set, due to lack of necessary data or significantly abnormal metric values. This reduces the possibility of drawing similarity between these two study methods, but despite that, the results were still seen to offer indicative outlook of both perceptions, similarly as Denis and Denis (1995).

5 Conclusions

The aim of this study was to examine the Nasdaq Helsinki companies short- and long-term performance changes after the CEO rotation. The examination was directed to changes where the departing and incoming CEO was announced with the same announcement, which was seen to indicate the change effect at its purest, as no uncertainty about a successor should exist in the markets. The data used was taken from the Refinitiv database, and the CEO change announcement was searched from the Nasdaq database. The selected companies were all publicly listed companies in the Nasdaq Helsinki, which had 260 days of stock price information prior the change announcement, and 10 days after. The data was analyzed using Microsoft Excel 2016 – spreadsheet editor, which was also used to produce the graphs seen in this study.

The short-term performance was analysed using an event study methodology that indicates the abnormal stock market reactions, or in other words, the market reaction that was not caused by normal market movement (Vaihekoski, 2004). These abnormal reactions were seen to offer insight into short-term performance change, caused by the CEO rotation. In the event study, the selected estimation window was defined as 250 days prior the start of the event window, and which was defined as 10 prior and 10 days after the event. The long-term performance was examined with accounting study, using ROE and ROA as indicative metrics. The accounting study aimed to offer insight into company's performance in 7-year horizon around the change, and hence, explore if the company's performance changed through the CEO rotation.

By summarizing, the defined study questions aimed to explore the performance changes. The main study question that concerned overall performance changes was defined as follows:

How did the CEO change impact the company's short- and long-term performance?

Referring to positive stock market reactions, investors found CEO change as a value creative improvement that caused increased short-term market performance. More briefly, the event date itself caused a neutral reaction while a premature reaction was found significantly positive. From this information, two assumptions can be made. First, the market saw that CEO rotation is favorable in terms of future performance, which is in line with Weill's and Pessarossi's (2013) ability hypothesis, according to which companies change the CEO only if the incomer is seen to outperform the departing. Secondly, the market information was not seen as equally distributed, as the investors received the information before the actual announcement, after which, the reflection of information continued, ending up with a 6.10 % cumulated abnormal return through the event period [-10, 10]. The finding is against the efficient market hypothesis, as well as against the strong market form introduced by Fama (1970), according to which no biased information should exist in the markets.

Regarding the long-term performance change, the study found clear increase in the selected account metrics during the 3-year post-departure period, which speaks behalf that incoming CEOs truly managed to increase the return when serving the investors and company's assets. This finding is in line with the investors positive approach, and therefore, it could be stated that investors were able to predict the direction of the future. However, due to changes in the sample size, this study does not claim direct consequence between these two matters, but moreover, aims to giving indications of occurred performance changes. As in the examination of stock market reactions, the findings support the Weill's and Pessarossi's (2013) ability hypothesis, which states that the change will be beneficial in terms of future profits. Additionally, through the pre-departure period, the sample companies shared the similar ROE's and ROA's with their peer groups, and hence, in light of these figures, the study did not found alarming problems in companies earning power before the departure.

The results of this study share the similarities between many prior studies, even though the study field has not been able to find the consensus on CEO transition effects. To start with the positive market reaction, Pessarossi and Weill (2013) as well as Huson et. al. (2004), found positive reaction after the CEO change. Hence, these viewpoints favour the perception

of increased short-term market performance and speaks behalf that investors see the change as a value creative improvement in terms of future performance. Also, the similar premature market reactions has also been priorly evidenced, which supports the perception of biased information in the markets (Pessarossi & Weill, 2013) This draws a generality that locking this kind of information into an inside of a company is challenging, and therefore, the transition effect can be, at least partially, priced before the actual announcement. Additionally, Denis and Denis (1995) states that the underlying factors vary a lot depending on the individual study, and therefore, comparing the results with prior event studies is challenging, but still gives indicative perception of investors behaviour in the certain environments.

The similar long-term performance results have also been priorly noted, for example by Denis and Denis (1995), as well as by Huson et. al. (2004). These studies found results to be deviated depending on the underlying factors, such as market environment, corporate- and investor control, the company structure, and whether the departure was voluntary- or non-voluntary. When considering and comparing the evidence of this study between these prior studies, it is crucial to be aware how these variables may affect the outcome. Also, one should be considered is that these studies are implemented by different income metrics, and therefore, the results could be biased due to management's accounting planning. Regarding this, Huson et. al. (2004) investigated their sample companies balance sheet structures and found clear increase in total assets, which in turn changes the outcome of the ROA.

The sub-question of this study aimed to exploring the performance differences between inside- and outside arriving successors, and it was presented as follows:

How did the short- and long- term performance change vary depending on the origin of the incoming CEO?

The market reacted with higher positive response to announcements where outside successor was named, and therefore, the short-term market performance was better in the subgroup of outside successors. If looking just the premature reactions, the higher positive reactions were evidenced in the subgroup of inside successors, but however, the higher variance could be

explained by relatively low sample size ($N = 10$). If considering other perception, the difference could be consequence of leaked information, which could be somehow natural if a person is rotating to another role in the office. On the contrary, in the long-term performance examination, the inside successors were evidenced to offer better results in terms of ROA and ROE. Especially the increase of ROE was much higher but considering the small subgroup sample size ($N = 5$), it could be consequence of individual balance sheet structures in these firms. As previously mentioned, due to different sample sizes, this study does not aim to draw a direct line between the short- and long-term performance metrics in this subgroup examination, but furthermore, the study results can be observed as indicative benchmark for future studies.

The prior literature does not share a consensus on which subgroup is ultimately better successor for individual company, and furthermore, most of the literature focuses on explaining the differences of capabilities between these different origin leaders. By simplifying Schepker's and Thatcher's (2017) insights on the matter, the inside successors are seen as a more stable solution when the company is seen to be on the right track, while the outside successor is alarmed when the company's strategy needs radical changes. In their study, the insider successors were seen to outperform the outside successors thanks to "less is more"- style of thinking, or in other words, the inside successors were seen to offer productive improvements with minimum strategic changes, while the outside successors experienced inefficient strategic changes with high transition costs. Despite this, also the contrary perceptions have been presented regarding incoming leaders, and moreover, some of the benefits may occur in the longer horizon than the selected three years prior (Zhang & Rajagopalan, 2010).

As prior studies address, this study field includes countless variables that may affect in the eventual result. Therefore, generalizing the single-voiced truth is practically unfeasible and not even desirable. This does not exclude the usefulness of these perspectives, which may offer investors or company leaders significant value when making investment decisions or decisions of rotating the CEO in the office. As evidenced, strong market- and performance changes indicates CEO's importance in the terms of the creditability and company success, and therefore, the change may affect crucially in the future. Since no other study (according to the author's knowledge) examines this subject in the Finnish context, it would be

meaningful to implement the same study with a broader horizon using complete and extensive data on CEO changes. From the author's perspective, it would be reasonable to combine markets from the same region, such as Sweden and Norway, to broaden the outlook and the data used. To more specify the underlying factors, it would be meaningful to divide the companies by prior performance or due to departure reason, and throughout that, explore how the changes differs between different baselines.

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Appendices.

Appendix 1. The sample companies.

** = Used in the accounting study

Afarak Group SE **	21.5.2015	Inside
Ahlstrom	16.5.2014	Inside
Aktia Bank Abp **	9.9.2016	Outside
Apetit Oyj **	31.5.2019	Outside
Basware **	26.9.2016	Inside
Caverion Oyj **	27.9.2016	Outside
Cargotec Corp **	28.1.2013	Outside
Citycon Oyj **	20.1.2014	Outside
Digitalist Group Plc	12.9.2017	Inside
eQ Oyj **	4.9.2012	Outside
Exel Composites Oyj **	16.9.2013	Outside
Honkarakenne Oyj **	7.5.2012	Outside
Huhtamaki Oyj **	7.1.2019	Outside
Ilkka Oyj **	20.12.2016	Inside
Konecranes Abp **	7.10.2019	Outside
Kesko Oyj **	28.5.2014	Outside
KH Group Oyj **	6.3.2018	Outside
Metso Oyj **	22.6.2016	Outside
Pihlajalinna Oyj **	11.12.2017	Inside
Panostaja Oyj **	26.10.2018	Inside
Pöyry	12.6.2012	Outside
Ramirent	23.2.2016	Outside
Reka Industrial Oyj **	12.8.2019	Outside
Siili Solutions Oyj **	1.11.2019	Outside
Suominen Oyj **	3.8.2018	Outside
Takoma Oyj	14.2.2014	Outside
Takoma Oyj	16.1.2015	Inside
Tecnotree Oyj	28.5.2013	Inside
Nokian Tyres plc **	27.5.2014	Outside
Wulff Yhtiot Oyj **	17.9.2019	Inside