The Impact of Chief Executive Officer Turnover on Capital Markets: Evidence from an Event Study.

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ABSTRACT

The effect of CEO replacement

The role of the chief executive officer is one of the most important within a company due to their prominent influence on corporate management and strategy. For this reason, everything concerning this figure is carefully examined by the **capital market** as they shape both current and **future value** of the company.

The purpose of this analysis is to assess the **magnitude**, **significance**, and **direction** of the market response to the **CEO turnover** in relation to **different scenarios**, to observe how the market's reaction varies according to circumstances. Specifically, it explores the influence of factors such as the pre-substitution company's **profitability**, **efficiency**, **short-term solvency**, **marketability**, the **nature of the CEO's departure**, and **industry classification**.
The final aim is to provide companies with useful data to understand under what conditions it is best to undergo a CEO replacement without negatively impacting the market value of the firm.

To achieve this output, the event study methodology was implemented on a sample of 164 US-based companies sourced from the "CEO Dismissal Database" created by Richard et al. (2021) which reported a CEO substitution between 1995 and 2018.

The findings of this research suggest that the event of CEO replacement has a notable effect on the financial market. While for each scenario analyzed the market response varies in magnitude and significance, most of the reactions of the different subgroups tended to be consistently positive.

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Keyword: capital market, future value, magnitude, significance, direction, CEO turnover, different scenarios, profitability, efficiency, short-term solvency, marketability, nature of the CEO's departure**,** industry classification.

Portuguese version:

O efeito da substituição do CEO

O papel do diretor executivo é um dos mais importantes dentro de uma empresa devido à sua influência proeminente na gestão e estratégia empresariais. Por esta razão, tudo o que diz respeito a esta figura é cuidadosamente analisado pelo **mercado de capit**ais, uma vez que determina o **valor** atual e **futuro** da empresa.

O objetivo desta análise é avaliar a **magnitude, significância** e **direção** da reação do mercado à **rotação do CEO** em relação a **diferentes cenários**, para observar como a reação do mercado varia de acordo com as diferentes circunstâncias. Especificamente, explora-se a influência de factores como a **rendibilidade** da empresa pré-substituição, a **eficiência**, a **solvência a curto prazo**, a **negociabilidade**, a **natureza da saída do CEO** e a **classificação do sector.**
O objetivo final é fornecer às empresas dados úteis para compreender em que condições é melhor proceder a uma substituição do CEO sem afetar negativamente o valor de mercado da empresa.

Para alcançar este resultado, a metodologia de estudo de eventos foi implementada numa amostra de 164 empresas sediadas nos EUA, provenientes da "CEO Dismissal Database" criada por Richard J. et al. (2021), que relatou uma substituição de CEO entre 1995 e 2018.

Os resultados desta pesquisa sugerem que o evento de substituição do CEO tem um efeito notável no mercado financeiro. Embora, para cada cenário analisado, a resposta do mercado varie em termos de magnitude e significado, a maioria das reacções dos diferentes subgrupos tende a ser consistentemente positiva.

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Título: O impacto da rotação de diretores-gerais no mercado de capitais: Evidências de um estudo de eventos.

Palavra-chave: mercado de capitais, valor futuro, magnitude, significância, direção, rotação do diretor executivo, diferentes cenários, rentabilidade, eficiência, solvência a curto prazo, negociabilidade, natureza da saída do diretor executivo, classificação do sector.

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1 INTRODUCTION

Within a company, one of the most prominent figures is the Chief Executive Officer, at the top of the corporate hierachy, directly influencing the operational management and strategic decisions of a company. Furthermore, CEO's role within the company is so important that they often becomes a public figure, with their reputation and reliability strongly linked to the company's image. For instance, Bill Gates, CEO of Microsoft, Jeff Bezos of Amazon, Mark Zuckerberg, CEO of Meta, and many others, whose name has become very famous and possible private reputational scandals could affect the company's own reputation. For this reason, when a change of leadership occurs, frequently the market responds with fluctuations in the company's stock price in expectation of a possible significant change within the company that could then affect the company's future market value. As occurred in the leadership transition from Bob Iger to Bob Chapek at Disney in February 2020, where the stock dropped about 3.6 percent on the same day.

It is therefore necessary for a company to understand and predict how the market might react to choose the best time and circumstances for a leadership replacement to mitigate the risk of possible negative effects on the company's market value.

The research question of this analysis is to understand and quantify how the market's response to this peculiar corporate event: the CEO turnover. Its thus aim is to understand how investors perceive this event through the application of an event study analysis. It is further aims to study how the relationship between CEO turnover and market response is affected by a range of factors. Indeed, assessing the magnitude, direction, and significance of the impact these events have on a firm's stock price is usually complex, with multiple possible outcomes. This complexity arises from the interplay of various factors that shape investor expectations regarding the company's future market value after the event. Therefore, it was necessary to introduce a range of variables into our analysis. Specifically: the pre- substitution company's profitability, efficiency, short-term solvency, and marketability, each measured through different financial ratios, the nature of the CEO's departure, so whether the relationship ended on good terms or not and how the market response differs among different industries, namely: tech, healthcare, financial services, and industrial**.**

Thus, our aim is contributing to the research on market response to corporate events, bringing new insights into how investors interpret and respond to CEO transitions, in order to understand under what circumstances, it is most appropriate to undertake a change in leadership.

2 LITERATURE REVIEW

2.1 Market efficiency

The relationship between information and financial markets is complex and has been widely discussed and studied, it thus enjoys a broad literature, often not unilateral. Surely the disclosure of information might affect in some ways the market's trend, but nothing is certain regarding the speed, magnitude, and direction of this effect.

According to Eugene F. Fama (1970), the characteristic of the impact of information depends on the market's degree of efficiency. In the lowest one known as the weak form; stock prices reflect all information related to historical prices. In the semi-strong form, stock prices also reflect publicly accessible information. Finally, in the strong form, even privately available information is incorporated in the price, and so the the true underlying value of the company would be reflected by its stock price. The direction of the effect that the incoming new information generates in the financial market depends on how the market's agent perceives the latest information whether as positive or negative news. Because of the information asymmetry present in the market, it becomes crucial for those who disclose information to be able to communicate it in a way that is perceived by investors as a signal that such a change will positively affect the future firm's value is positive.

In corporate governance, corporate event, and the information that they bring on the market can have significant impact on a firm's stock price.

Analyzing how the market reacts to such event is complex, often leading to several different outcomes. This complexity arises because several variables influence the expected value of a company, either increasing or decreasing the effect on stock prices. Hence the need to include additional variables in our analysis to study the market response to the CEO turnover.

For Instance, the introduction of a new product on the market is generally associated with significantly positive abnormal returns. However, financial markets consider not only innovation-specific information, but also factors relating to managerial incentives. Consequently, companies characterized by determinate qualities are more likely to register a more significant effect, as corporate governance factors are important for investors in assessing the valuation effect of innovation. (Lin & Chang, 2011).

In some cases, corporate governance factors are so influential that they can even change the direction of stock price movement. For example, the announcement of dividend-initiating firms, may be perceived as a value-increasing event for some firms, while for other may be a value- decreasing event due to different firm specific characteristics (Zhenhu Jina, 200).

Similarly, in the case of layoff announcements, Palmon et al. (1997) research shows that when market participants attribute the layoffs to declining demand, the abnormal returns are negative. However, when the layoffs are viewed as a result of efficiency improvements, the abnormal returns are positive.

This highlights the complexity involved in formulating hypotheses and indicates that the results obtained from the analyses are not universal principles but are valid only for the specific scenario.

2.2 The CEO replacement effect

The figure of the CEO within a company is of paramount importance. The CEO in fact has a significan influence on determining the company's strategic direction, fostering innovation, and shaping the mission and the vision of the company. In general, the CEO has a significant impact on the organizational outcome of the company. (Quigley & Graffin, 2017).
Everything about the figure of the CEO is crucial to understanding a firm's future performance. This includes not only their decisions but also their personality, indeed it can affects Top Management Team Dynamics, which, in return, can influence the organizational performance. (Peterson et al., 2003).
Therefore, the CEO's role and reputation directly affect company's reputation and competitive advantage. Consequently, anything related to the CEO can impact the firm's stock price and overall market perception. When the CEO is well-known, this influence is enhanced. The more renowned the CEO, the more the company benefits in terms of competitive advantage. However, this also aises the company's risks, as a well-known CEO is more likely to face media scrutiny and pressure. (Ranft et al., 2006).

The replacement of a CEO is a highly sensitive event that can influence the capital market, as the arrival of a new top manager may signal major directional changes within the company. The impact of this change can lead to either positive or negative outcomes, depending on market expectations.

Huson et al. (2004) found a statistically significantly positive average abnormal stock returns coincide with management turnover announcements. This suggests that investors view turnover announcements as good news because they expect that turnover will prompt performance improvements, on average. (Huson et al., 2004).

Other studies, however, reveal how the output may vary depending on the reasons behind the termination of the relationship between the CEO and the company, such as the CEO's personal characteristics, poor performance, or the intention to pursue a new strategic direction. It is based on these characteristics that market agents form their expectations—whether optimistic or pessimistic—about the company's future, which are then reflected in the fluctuations of the firm's stock prices.

For instance, Ertugrul and Krishnan provided empirical evidence showing significant variations in stock returns leading up to CEO dismissals. They distinguish between firms that implement early dismissals and those opting for late dismissals, finding that early dismissals are associated with significant negative market reactions, whereas late dismissals exhibit less pronounced effects, since early CEO dismissals are more likely to be associated with corporate scandals. (Ertugrul & Krishnan, 2011).

Reinganum, by implementing the event study methodology, identified an overall positive market reaction to executive succession. He further demonstrated that the magnitude of this positive impact depends on specific firm characteristics, including firm size, the origin of the successor, and the disposition of the predecessor. The strongest market reactions are observed in smaller firms, those that appoint external successors, and when the departing CEO fully exits the company. (Reinganum, 1985)

2.3 The CEO replacement effect and the pre-event company performance

One of the main factors considered in studying the effect of CEO substitution is also the pre-event company performance. There is a particularly strong relationship between firm's performance and the decision to replace its CEO. Empirical evidence suggests that there is a statistically significant relation between a poor firm performance and the likelihood of CEO turnover. Additionally, increased scrutiny of firm performance by the financial press puts pressure on the board to remove the CEO. (Farrell & Whidbee, 2002).

According to Jenter et al. (2015) The performance of a CEO is consistently compared to that of their peers within the same industry, and this comparison significantly influences decisions regarding their substitution. CEOs who underperform relative to their peers are far more likely to be dismissed, especially during periods when the industry as a whole experiences poor returns. Equally significant, in this regard, are investment analysts' stock recommendations,

which, by evaluating financial performance, influence the board's decision on CEO dismissal (Wiersema & Zhang, 2011).

In light of this, the effect of a CEO replacement on the capital market may differ depending on the prior performance of the dismissed CEO. Market participants may view the decision to replace the CEO as a signal of internal challenges and poor performance, shaping their expectations about the company's future accordingly. According to Carretta et al. (2010), stock returns are negatively affected by news related to changes in the board of directors for profitable firms, but not in the case of non-profitable firms.

This analysis intend to further contribute to the existing literature by exploring how the market does react to a corporate event, specifically CEO substitution, and how this reaction is influenced by a range of other factors.

3 HYPOTHESES

Based on the previously studies, mentioned in the literature review, the main hypothesis is that the event studied, regardless of the factors considered and included in the analysis, generates on average a significant reaction in the capital market. The CEO's role within a company and his eventual substitution are too fundamental to go unnoticed by the investor's eyes who use these informations to shape their current and future evaluation of the market value of the company. However, is difficult to forecast over the entire sample the direction, the magnitude, and the level of significance of this effect. As shown in the previous analysis, the magnitude and the direction market's response to a corporate event are influenced by multiple factors, and for the same event under analysis the impact may vary depending on the circumstances.

Moreover, beyond the primary hypothesis we formulated the following secondary hypotheses concerning how specific factors and circumstances influence market reaction to CEO replacement. We believe that some specific company's characteristics also play an important role in the determination on the relationship between CEO turnover and market reaction. These characteristics are profitability, efficiency, short-term solvency, and marketability. Specifically, we hypnotize a more significant positive reaction when the company's level of profitability efficiency and solvency in the short term are higher than the median for the relevant industry. On one hand, when a CEO replacement occurs and the company involved had a pre-event poor performance relative to its industry median, the investors may perceive the decision of replace the leadership, as an attempt to change the company's direction to bring its performance up to or above the corporate average. This vision suggests an appreciation of the company's value. Conversely, when the company already demonstrates high levels of profitability solvency and efficiency before the event, with the entry of new CEO and the possibility of changes in strategy, the market might fear a reduction in these performance values. However, I believe that even in this case, when a company undergoing a CEO turnover with some financials' problems already before the substitution, it might generate grater uncertainty in the market, causing a more significant loss of investor confidence compared to a healthier company. Poor financial health may signal internal problems, bringing concerns that the situation may get worst even more in the short term after the leadership change.

Regarding the marketability of a company, measured in this analysis by the price-to earnings ratio, its impact on market reaction is ambiguous. While on the one hand, a firm with a high price-to-earnings ratio, above its industry peers, may signal strong growth expectations, a poor

price-to-earnings ratio, lower than the industry median, might signal steady growth. However, a high price-to-earnings could also indicate that the company is overvalued by the market, conversely a poor price-to-earnings ratio, lower than the industry median an undervaluation of the company's stock. Given this, having these two opposite effects tending to offset each other, I hypothesize that this factor does not significantly affect the direction of the market response to the event studied.

Focusing on the quality of the outgoing CEO's departure, I believe that when the relationship ends abruptly, the market reaction will be more negative. An unfriendly departure could signal uncertainty and internal problems, which could then be reflected in stock market fluctuations.

Regarding industry specific effect, we expect the results to be more significant and broader within the more static sectors, like the industrial, where changes of CEO and in general changes in the corporate sphere are less frequent, and therefore when they do take place, we expect them to have more impact on the market. A strong market impact is also expected in less regulated industries. In highly regulated sectors, the CEO has limited authority to intervene and alter business strategy and management, making it difficult for leadership changes to drive significant transformations within the company, thus the shift from old to new CEO is expected to ensure greater continuity at the corporate level, leading to a market value that remains broadly in line with prior levels**.**

4 METHODOLOGY

4.1 Data Analyzed

The sample analyzed in this study includes 164 companies, from the U.S. geographic area, operating in the following industries: Business Equipment, Chemicals, Durable Goods, Financial Services, Food & Beverage, Healthcare, Manufacturing, Mining, Nondurable Goods, Oil & Gas, Other Industries, Retail, Consumer Services, Telecommunications, and Transportation. Each of these companies reported a CEO substitution between 1995 and 2018.

The companies used in this analysis were sourced from the "CEO dismissal database" created by Richard et al. (2021). This Database reports the reasons for CEO substitution in S&P 1500 companies from 2000 to 2018.

Table I: Ratio Overview

Table summarizing key statistics, including, mean, standard deviation, median, minimum, median and maximum values for the following financial indicators, calculated for each firm in the sample: Return on Assets, Return on Equity, Total Debt to Current Capital Ratio, and Asset Turnover.

Variables	Mean	Std	Min	Max	Median
P/E	18,02	152,48	-2466,27	1009,38	15,33
Return on Asset	0,11	0,13	-0,94	0,57	0,11
Return on Equity	0,11	0,60	-2,72	15,50	0,11
TotalDebt/Equity	2,66	7,93	-147,86	122,70	1,30
Current Ratio	2,31	1,61	0,38	14,94	1,91
Asset Turnover	0,99	0,81	0,01	5,21	0,85

4.2 Event Study

To analyze how the capital market reacts to CEO replacement events, this analysis employs the event study methodology.

This approach enables us to asses the impact of corporate events on firm value by examining the return behavior of a sample of firms experiencing a common event, even if the timing of the event varies across firms.

This methodology highlights the differential, known as the abnormal return (AR) , between the stock's actual return and its expected return, which is estimated using predicting models to approximate the firm's performance in the absence of the event:

$$AR_{it} = r_i - e(r_i) \text{ (1)}$$

Where: r_i is the realized return on stock i at time t and $e(r_i)$ is the expected return on stock i. In this study the Abnormal Returns for each firm were retrieved by CRSP Event Study module over a 21-day event window: 10 before the event, event day itself, and 10 days after.

Regarding the selection of the event window to employ in our analysis, we selected a time frame of 21 days to capture the market response in the short term. Reducing the risk of including in our study other factors or events unrelated to CEO turnover that might skew the results, while still being able to capture the market response correctly reflect the impact of the event itself. According to Peterson (1989), the selection of the length of the event period is left to the researcher, who must weigh the benefits of a longer period, such as an improved prediction model and the costs of a longer period, such as model parameter instability. However, in the literature, typical event periods range from 21 to 121 days for daily studies. (Peterson, 1989).

To calculate the expected return, I employed the Fama and French three-factor model:

$$r_{jt} - r_{ft} = \alpha_j + \beta_{j1} MRP_t + \beta_{j2} SMB_t + \beta_{j3} HML_t + \varepsilon_{jt} \text{ (2)}$$

Where: r_i is the realized return on stock j at time t; r_{ft} is the risk free rate at time t; MRP (Market Risk Premium) is the excess return on the market at time t, computed as the difference between the return of the realized market return at r_{mt} and the risk free r_{ft}; SMB (Small Minus Big) is the average return on the three small portfolios minus the average return on the three big portfolios at time t; HML (High Minus Low) is the average return on the two value portfolios minus the average return on the two growth portfolios at time t, ε_{jt} is the residual excess return at time t. (Fama & French, 1993).

For the robustness testing, the results were verified using an alternative model:

$$r_{jt} - r_{ft} = \alpha_j + \beta_{j1} MRP_t + \beta_{j2} SMB_t + \beta_{j3} HML_t + \beta_{j4} MOM_t + \varepsilon_{jt} \text{ (3)}$$

This four-factor model, called the Carharts Model, differs from the previous one by incorporating the Momentum factor (MOM). Momentum is a pervasive anomaly in asset prices, which stipulates that over an intermediate horizon of three to twelve months, past winners on average continue to outperform past losers (Jegadeesh & Titman, 1999). This phenomenon suggests that assets, for a set period, are inclined to continue their performance trend consistent with their historical performance trajectory, violating the efficient market hypothesis in its weakest form (Fama & French, 2016).

To draw overall inferences about the studied event, I aggregated the ARs to obtain the cumulative abnormal return (CAR):

$$CAR_i\,(t_1, t_2) = \sum_{t=t_1}^{t2} AR_{it} \quad (4)$$

The CARs were computed within the entire event window [-10; + 10], starting from the AR of day -10 and accumulating up to CAR [-10; 10]. This process resulted in a series of one AR and twenty CARs for each firm.

Finally, to obtain an overall view of the sample, CARs across all firms were averaged, yielding the cumulative average abnormal return (CAAR):

$$\text{CAAR} = \frac{1}{N}\sum_{i=1}^{N} CAR_i \quad (5)$$

To verify the statistics significant of the result for each CAAR of the time span I use the cross – sectional test:

$$t = \sqrt{N}\,\frac{CAAR}{S_{CAAR}} \quad (6)$$

Where:

$$S_{CAAR}^2 = \frac{1}{N-1}\sum_{i=1}^{N}(CAR_i - CAAR)^2 \quad (7)$$

with the null hypothesis of $E\,(CAAR) = 0$.

4.3 Firm’s performance

As emphasized in the literature review, stock price movements following a CEO substitution are often influenced by a variety of firm-specific factors. One of the most significant is the company's performance prior to the replacement.

For the evaluation and measurement of corporate performance, the Ratio Analysis was employed. This technique serve as as a predictive tool for measuring business performance, identify strengths and weaknesses of a company, and determine whether a company have been improving or is deteriorating financially over a period of time. (Adedeji, 2014).

Beaver, through his research, demonstrates that ratio analysis is a valuable tool for predicting and assessing a firm’s financial health. In his study, he finds that the ratio distributions of nonfailed firms remain stable throughout the five years before failure, whereas the ratios of failed firms deteriorate significantly as failure approaches. This leads to a widening gap between the two groups, resulting in persistent differences in their mean ratios, which become increasingly pronounced as failure nears. (Beaver, 1966).

Additionally, Beaver, highlight that the price changes of the common stocks act as if investors rely upon ratios as a basis for their assessments, and impound the ratio information into the market prices. (Beaver, 1968)

For each company of the sample the following ratio were retrieved form Compstat, over a two-year time frame, one year preceding the replacement.

To measure the profitability, defined as firm’s ability to generate profit, I used the Return on Equity (ROE) and the Return on Assets (ROA). ROE is expressed as Net Income divided by average Book Equity based on most recent two periods, where Book Equity is defined as the sum of Total Parent Stockholders' Equity and Deferred Taxes and Investment Tax Credit. ROA, on the other hand, is calculated as Operating Income Before Depreciation divided by average Total Assets based on most recent two periods. (WRDS Research Team, 2016). Thus the ROE captures the firm's capability to produce profits specifically relative to shareholders' equity while the ROA specifically relative to its assets.

Additionally, to measure the liquidity, which reflect the firm's ability to meet its short-term obligation I used the Current Ratio. This metric, as provided by WRDS, is calculated by dividing Current Asset over Current Liabilities. (WRDS Research Team, 2016)

To evaluate the solvency, the firm's ability to meet its long-term obligation, I employed the Total Debt-to-Equity Ratio, defined as total labilities to shareholders' equity (common and preferred). (WRDS Research Team, 2016).

To assess the marketability of firm's stock, I relied on the Price Book ratio, expressed as a multiple of Market Value of Equity to Book Value of Equity. (WRDS Research Team, 2016).

Finally, to assess efficiency, meaning how efficiently a company uses its assets and to generate sales, I used the Asset Turnover Ratio, which is defined as: Sales as a fraction of the average Total Assets based on the most recent two periods. (WRDS Research Team, 2016).

The benchmark used to assess the company's health through these ratios is the industry-level ratios for the same year, also retrieved from Compustat. To reduce the impact of outliers, which can distort the average, the median was chosen as the aggregation method for computing industry-level ratios. The industry took in consideration were Business Equipment, Chemicals, Durable Goods, Financial Services, Food & Beverage, Healthcare, Manufacturing, Mining, Nondurable Goods, Oil & Gas, Other Industries, Retail, Consumer Services, Telecommunications, and Transportation.

The research conducted by Mcdonald et al (1984) evidences indeed that the ratio method for analyzing and evaluating a firm is more consistent when the test is made with a intra-industry sample. In this scenario, the simple ratio method consistently dominates in its ability to measure the relationship of two financial variables in a homogeneous sample. (Mcdonald & Morris, 1984)

Comparably, Bird et al. (1977) emphasize that the ratio analysis can be used to build up a picture of a firm relative to its closest competitors, so companies belonging to the same industry. They further suggest that, extreme values of a particular ratio, especially values which differ from the industry mean by 2 or 3 standard deviations, should be investigated. (Bird & Mchugh, 1977)

Additionally, by comparing with industry-level ratios —and therefore with the firm's competitors— Is possible to mitigate the risk of misinterpreting negative company performance caused by internal problem rather than external factors. This is particularly relevant, as the chosen time span includes market shocks like the dot-com bubble and the 2008 financial crisis. Benchmarking against the industry thus helps understand if poor performance reflects a broader trend or is specific to the company.

Each firm's financial ratios were then compared to the median of its industry using the following percentage deviation formula:

$$\left(\frac{\text{Firm's Value} - \text{Industry Median}}{\text{Industry Median}}\right) * 100 \quad (8)$$

Subsequently, for each ratio, we collected the CARs of the firms performing below the industry median, with the CARs of firms that performed above it, to analyze how changes in performance influence capital market reaction to CEO turnover.

To conduct this analysis, the CAR of the two groups were computed separately and then their mean values were compared using a mean test. This test, under the null hypothesis that the difference between the means is equal to zero, is aimed to verify whether the observed difference is significant.

The test statistic is calculated as follows:

$$t = \frac{\mu_1 - \mu_2}{\sqrt{\frac{s_1^2}{n_1}} + \sqrt{\frac{s_2^2}{n_2}}} \quad (9)$$

where:

$$s_{CAAR}^2 = \frac{1}{N-1}\sum_{i=1}^{N}(CAR_i - CAAR)^2 \quad (10)$$

4.4 Exit Quality

Another factor incorporated into the analysis is the nature of the relationship termination between the company and the outgoing CEO, which is categorized as either *healthy* or *not healthy*.

To study how the nature of the termination impacts the effect under analysis, the sample was divided into two subgroups: those with a *healthy* CEO departure and those without. After computing and observing the CARs and the CAARs for both subgroups, a mean test - similar to the performance analysis, (equation (9) and (10)) - was conducted to evaluate the significance of the differences between the two groups.

4.5 Industry

An additional factor introduced into the analysis is the industry classification of each firm, aim at studying how market reactions to CEO replacements vary across different sectors.

Prior research indeed reveled that Industries appear to have different degrees of sensitivity to the stock markets trends. (Hong, Torous, & Valkanov, 2007).

To investigate this effect, All companies have been classified into one of the following industry categories: technology, financial services, healthcare, and industrial. After collect the ARs and computed the CARs, we compared the CAARs across industries using pairwise mean tests (equation (9) and (10)) to determine whether the differences between them were statistically significant.

5 RESULT

5.1 Total Sample

An initial focalization of how CEO turnover events influence the stock market performance, without using any variable controls, shows that, on average, such events tend to have a positive impact on stock price. This output confirms the primary hypothesis of a significant market response to the CEO change.

As it possible to see in Table 2, all the CAARs all over the entire event window are positive, peaking on day +3 where CAAR (-10; +3) reaches 4,12% and is statistically significant at 1%. The validity of this outcomes is further reinforced by the results obtained when utilizing as a prediction model the Carhart Four-Factor Model. This alternative analysis also exhibits a consistency positive trend in CAARs, with no negative values present throughout the event window. Likewise, this analysis reports that the strongest reaction of the market arises on the third day after the event, where the CAAR (-10, +3) reaches 4.28%, again statisticant at the 1% level**.**

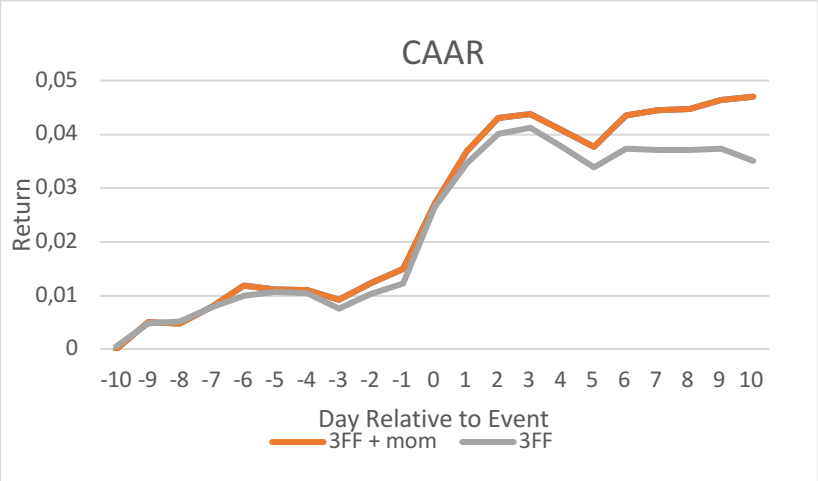
As it possible to observed in graph 1 expose below, it becomes evident that the sequence of CAARs predicted by the Fama-French market model closely aligns with the trend observed in CAARs estimated using the Carhart Model**.**

The pattern of the fluctuation reported by both methods are analogous, exhibiting maximum and minimum values at the corresponding time**.** However, an evident discrepancy appear when comparing the degree of these values, as the estimates produced by the Carhart Model tend to be higher on average and reveal a greater statistical significance**.**

Moreover, a deeper examination of the outcomes shows that during the pre-event period (from day -10 to day -1, CAARs appear systematically lower, in both models, compared to the post event period. This evidence suggests that the the CEO turnover has a greater impact in the days following the event, when the new CEO officially takes office**.** Overall, these findings indicate that, on average, CEO turnover has a positive influence on capital markets, particularly in the days following the event**.** This suggests that investors likely perceive CEO replacements as a favorable corporate event that could enhance firm value**.**

Graph 1: Cumulative Average Abnormal Return on the entire sample

This graph represents the CAAR of the entire sample computed over the event window [-10; + 10]. Is it possible to observe the comparison between the Fama-French three-factor model (3FF) and the Carhart Model (3FF+ mom).



5.2 Firm Performance

The analysis of the Cumulative Abnormal Returns adjusted for pre-event company performance suggest that the way the capital market responds to CEO turnover is partially influenced by some aspects of the firm's financial condition.

5.2.1 Return on Equity — Profitably

Focusing on profitability, the findings reveal that, on average, the capital market remains positive regardless of whether the company's Return on Equity (ROE**)** was below or above the industry median. As it exhibits in graph 2, the CAARs pattern of the firms that that outperform the median closely aligns with those that underperformed**.** The two trends move together, intersecting at various points**.** However, the four days following the event**,** the positive CAARs reported by the underperforming companies exceed those of the outperforming firms.

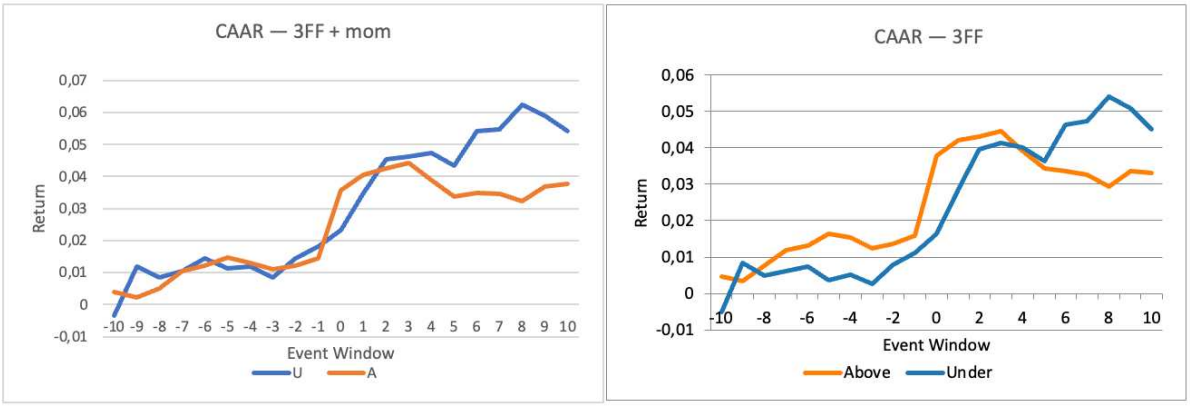
This effect is particularly evident when applying the Carhart model, where, on day +8, the underperforming firms reported a CAAR of 6.24%, statistically significant at the 5% level**,** whereas the outperforming firms records a 3.24% CAAR—still positive, but three percentage points lower**.**

Despite these differences, as it possible to see in Table 3, the difference between the two groups is never statistical significance at any point in the event window.

Given these findings, it seems that a firm's capability to produce profits relative to shareholders' equity, captured by the Return on Equity ratio, does not have a significant impact on stock market when a CEO turnover occur. This implies that investors, in both scenario, whether the company exhibits above-median profitability or below it, perceive the CEO replacement as a development event. However, the effect appears more pronounced when the company has been underperforming compared to its industry peers**.**

Graph 2: Comparative graph of the Cumulative Average Abnormal Return of companies with an above industry- median ROE and with a below – industry median ROE

This graph compares the CAAR, computed using the Carhart Model (3FF + mom) and Three Fama Factor Model (3FF), for firm's whose ROE was under the industry median - represented by the line labeled Under - and those above the median – represented by the line labeled Above- over the event window [-10; + 10].



5.2.2 Return on Asset — Profitability & Efficiency

The level of efficiency of a firm appears to influence the magnitude of the stock market reaction to CEO turnover. As shown in Graph 3, the trends of firms outperforming the industry median and those underperforming are quite aligned throughout the entire event window.

In both scenario the magnitude of CAARs is greater in the days after the event compared to the days previously. However, on average, as it possible to observe in Table 3, the outperforming

firms register grater positive value, across both models - the CAARs computed using the Three Fama Factor Model, and the Carhart Model.

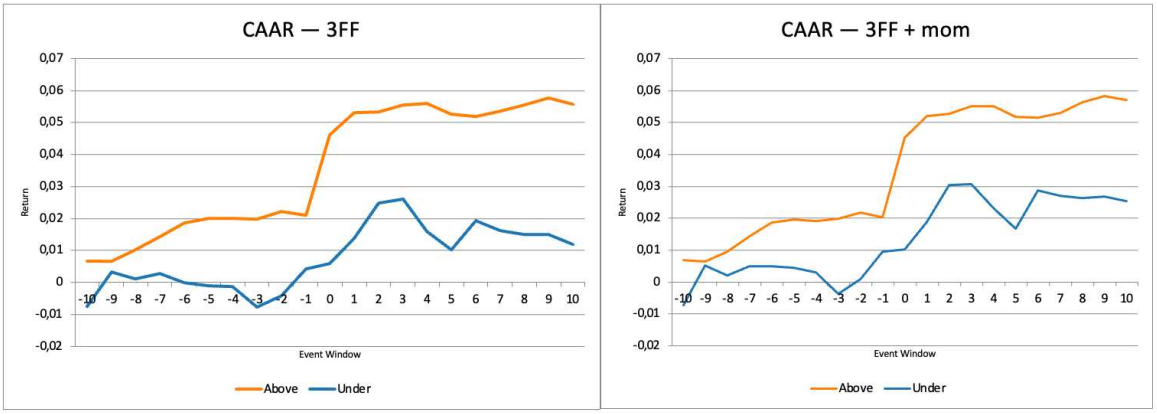
The underperforming firms not only reported lower values compared to the other group but also negative, dropping three days before the event with a CAAR of -0,77%. In the second part of the event window, starting from day 0, the market reaction appears to be more positive with an increase in CAARs. However, the peak reaches only 2.68% on day +3, and all values found are not statistically significant.

These results suggest that when a firm's efficiency is lower compared to its industry peers, market participants perceive this event as slightly negative. It is likely that the pre-existing uncertainty surrounding the firms is amplified by the CEO replace, as the CEO is one of the main figure within the company. Nevertheless, the registered values are not particularly large, indicating that the impact of low efficiency is not highly significant.

Conversely, when a firm exhibits efficiency levels above the industry median, the market impact is significantly more positive, with a peak at day +10, where CAAR reaches 5.58%, compared to 1.28% for the underperforming group—a difference of 4.38 percentage points, statistically significant at the 10% level. In this case, the CEO change is perceived as a positive event, something that could potentially increase the company's value.

Graph 3: Comparative graph of the Cumulative Average Abnormal Return of companies with an above industry- median ROA and with a below – industry median ROA.

This graph shows the CAAR, computed using the Carhart Model (3FF + mom) and Three Fama Factor Model (3FF), for firm's whose ROA was under the industry median - represented by the line labeled Under - and those above the median – represented by the line labeled Above- over the event window [-10; + 10].



5.2.3 Total Debt-to-Equity Ratio — Solvency

The level of a company's debt can influence how the stock market reacts to a CEO change. Looking at the data in Table 4, we can identify three different phases within the 21-day event window. The first phase is a short two-day period: AAR -10 and CAAR (-10; -9). During this time, companies with a debt-to-equity ratio lower than the industry average show a lower CAAR compared to their more indebted peers. In fact, companies with lower debt levels even show a negative CAAR. However, this difference is neither large nor statistically significant. Moreover, the negative CAAR recorded by the less indebted companies is minimal, at just -0.02%. At this stage, the company's level of debt does not seem to influence the market's response. It is important to note that when referring to "level of indebtedness," we are always considering the company's debt relative to its equity.

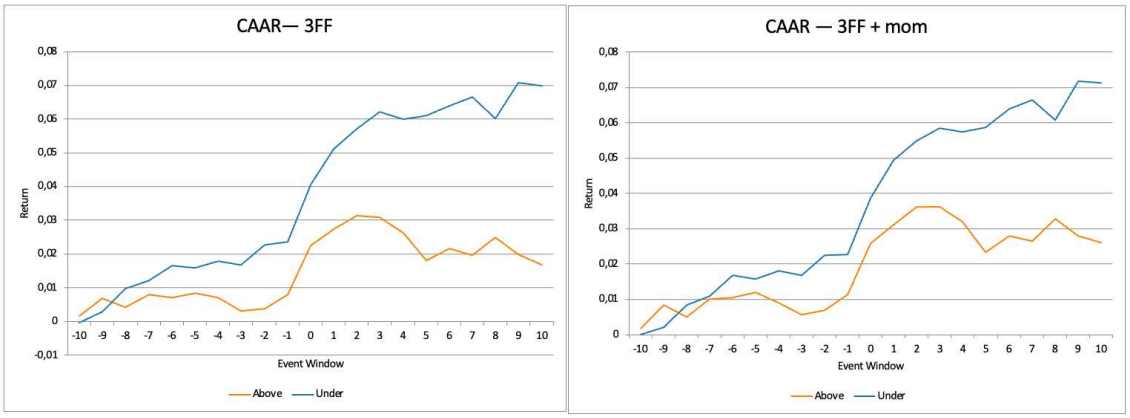
In the second phase, which span from day - 8 to the day before the event, covering an 8-day period, the trend reverses. Less indebted companies register a higher CAAR compared to their more leveraged counterparts. However, given the low significance and magnitude of both groups' CAARs and the difference between them, we cannot state that the level of debt relative to equity influences investors' perception of CEO change in this timeframe.

The scenario changes again from the event day onward, lasting until the end of the event window. The CAARs of companies with lower debt levels continue on the same upward trajectory from the previous days, increasing both in value and significance, reaching a peak CAAR (-10; +9) of 7.09%, significant at the 1% level. Meanwhile, the more indebted companies, despite showing an increase compared to the days before the event, do not reach similar levels. Consequently, the gap between the two groups widens, with differences reaching up to 5.32 percentage points by day +10. All these outputs are supported by the results obtained from the analysis of the CAAR computed with the CARhat model.

Given these findings, it seems that a company's level of debt relative to its equity does influence the market's reaction in the days after it . A CEO change in a company with a debt-to-equity ratio below the industry average is perceived more positively.

Graph 4: Comparative graph of the Cumulative Average Abnormal Return of companies with an above industry- median Total Debt-to-Equity Ratio and companies with a below – industry median Total Debt-to-Equity Ratio.

This graph represents Cumulative Average Abnormal Return (CAAR), computed using the Carhart Model (3FF + mom) and Three Fama Factor Model (3FF), for firm's whose Total Debt-to-Equity Ratio was under the industry median - represented by the line labeled Under - and those above the median – represented by the line labeled Above- over the event window [-10; + 10].



5.2.4 Price-to-Earnings — Marketability

The relationship between a company's market price per share and its earnings per share plays a role in shaping investors' expectations about how a CEO change might impact the firm's value. These expectations are then incorporated into stock price movements.

This financial metric is complex to interpret. A firm with a high price-to-earnings ratio, above its industry peers, may signaling strong growth expectations. However, it could also indicate that the company is overvalued by the market. At the same time, a poor price-to-earnings ratio, lower than the industry median, might signal steady growth or, alternatively, an undervaluation of the company's stock.

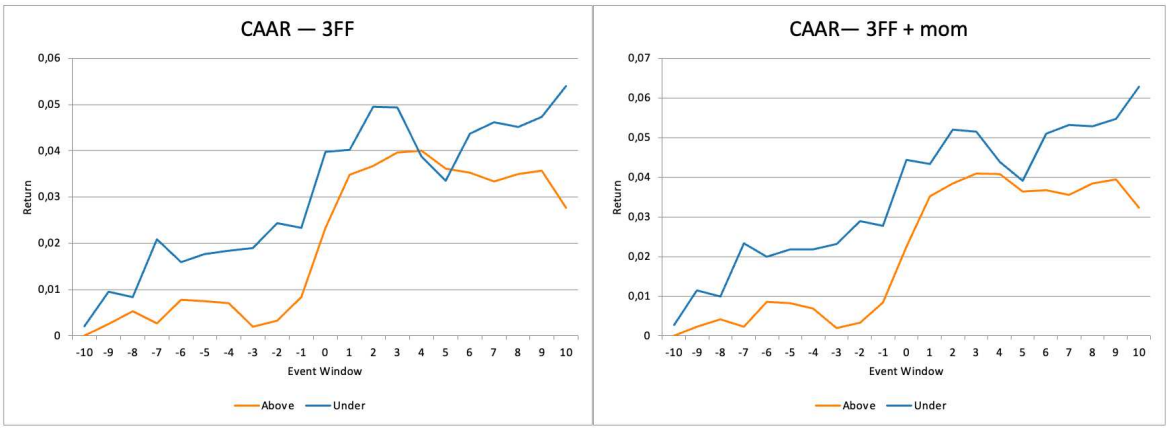
Looking at Table 5, it appears that, on average, regardless of whether a company's price-to-earnings ratio is above or below the industry average, the market reacts positively to a CEO change, suggesting that such an event is generally perceived as beneficial.

Moreover, both groups display a similar pattern: a relatively bland market reaction, as expressed by CAARs, in the days before the event, followed by an increase in both the magnitude and significance of the effect. However, it is reported that companies with a below-

average price-to-earnings ratio experience a stronger and more significant positive impact. This is evident in the analysis conducted using the Carhat model throughout the entire examined time span and, with minor exceptions, also in the analysis based on the Fama-French three-factor model—except for a brief two-day window. Additionally, is interesting that on day +10, the CAARs for the lower price-to-earnings group appear to sharply increase, while for the higher price-to-earnings group, the trend seems to decline at a similar slope. Given these findings, it appears that the market perceives a CEO change as a non-damaging event, regardless of a company's price-to-earnings level. However, the magnitude of the impact is smaller for companies with a higher-than-average price-to-earnings ratio.

Graph 5: Comparative graph of the Cumulative Average Abnormal Return of companies with an above industry- PE ratios median and with a below – industry median PE ratios.

This graph exhibits CAAR, computed using the Carhart Model (3FF + mom) and Three Fama Factor Model (3FF), for firm's whose Price-to-Earnings Ratio was under the industry median - represented by the line labeled Under - and those above the median – represented by the line labeled Above- over the event window [-10; + 10].



5.2.5 Current Ratio — Solvency

The short-term solvency of a company, measured through the relationship between current assets and current liabilities, can be a factor that influences the market's reaction to a leadership change. A solvency level above the industry median may be seen as an advantage for the company. At the same time, in the context of a leadership change, a company with lower-than-

average solvency could signal a shift in corporate strategy or a restructuring, potentially raising expectations of future growth in its market value.

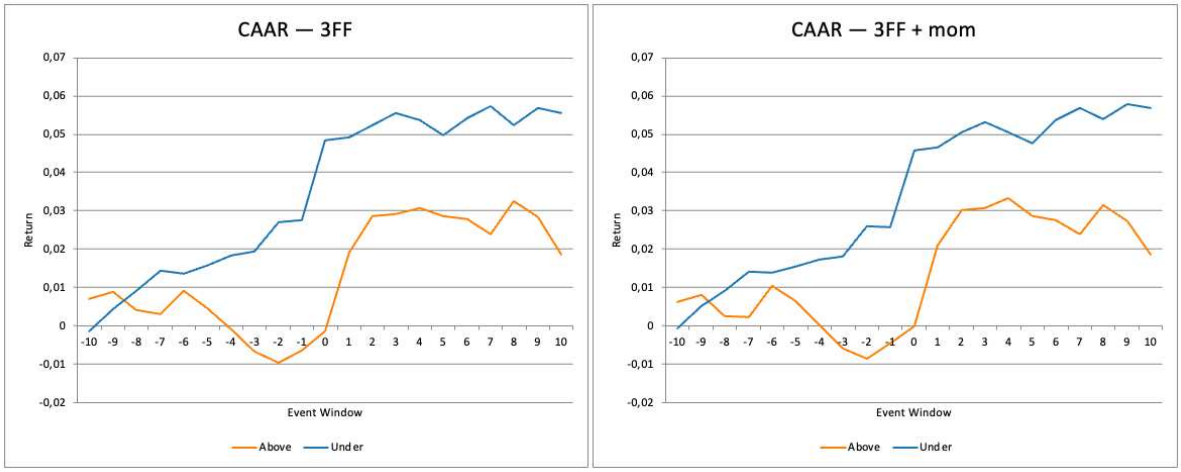
The outputs obtained using both market models, show that, on average, CEO replacements in companies with lower solvency levels are associated with a stronger and more positive market reaction compared to those in more financially solid companies.

As exhibit in Table 7, both groups register positive CAARs in the days succeeding the event. However, the below-median solvency group shows higher values. The real difference between the two trends arises principally in the days after to the event and on the event day itself, where companies with lower solvency reported a CAAR (-10; 0) of 4.85%, while more solvent companies record a negative CAAR (-10; 0) of -0.14%, marking a 4.99 percentage point gap. While the trend for less solvent companies continues to rise throughout the event window, more solvent companies register slightly negative values, though very minor.

These results suggest that a company's short-term solvency can influence market expectations regarding its future prospects and, consequently, its stock performance.

Graph 6: Comparative graph of the Cumulative Average Abnormal Return of companies with an above industry- Current Ratio median and with a below – industry median Current Ratio.

This graph exhibits CAAR, computed using the Carhart Model (3FF + mom) and Three Fama Factor Model (3FF), for firms characterized by an under the industry median Current Ratio - represented by the line labeled Under - and those with an above the median Current ratio – represented by the line labeled Above- over the event window [-10; + 10].



5.2.6 Asset turnover — Efficiency

The company's efficiency, meaning its ability to generate revenue through the use its assets, is one of the key parameters used to assess the overall company's health condition. Having an efficiency level higher or lower than the industry median can influence how market participants perceive corporate events. Indeed, a company's efficiency can be used to forecast its future value and performance, directly impacting its current market value.

A higher efficiency level may signal that the firm is currently experiencing a growth phase, and its characterized by an effective management of its assets, creating expectations of future value appreciation, which is then incorporated in the current stock price. However, it can also suggest that the company is not investing in new assets, meaning that is strategy is not aimed to expansion but to stability.

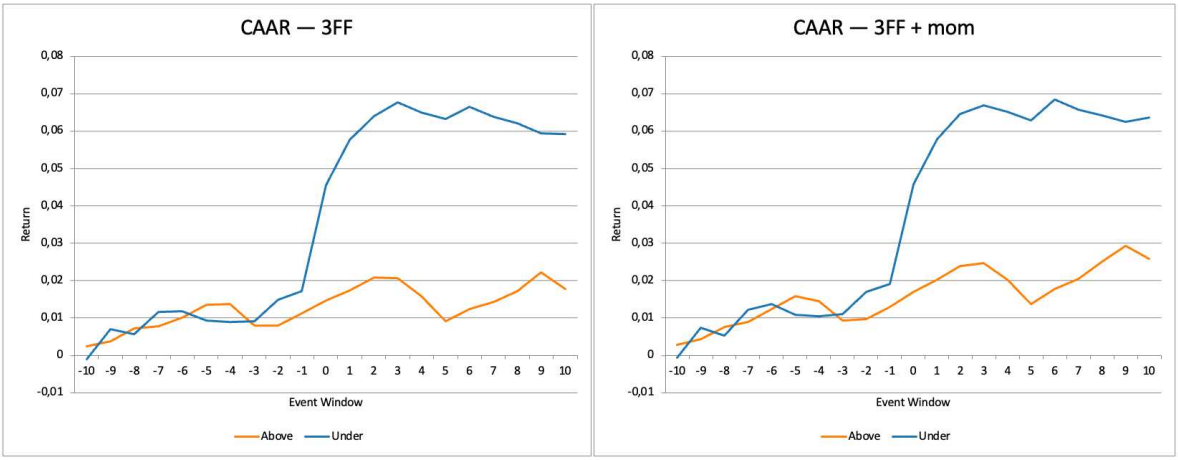
In the other hand, a lower level of Asset turnover ratio can signal a less efficient company's assets management, but it also common in newly established firms, or company aiming an expansion rather than stability. A strategy that leads to a substantial investment in asset disrupting the short-term balance between revenue and total assets.

Focusing on our sample, as exhibited in Table 8, in the days leading up the event, this financial ratio, strongly influence the market response to the corporate event under analysis.

Starting from the event day, companies with a lower asset turnover level compared to their industry peers, register a sharp increase in CAARs, meaning that the CEO change generate a positive expectation, reaching a CAAR peak of 6,77%. Thus, there is noticeable different between the two groups across the second part the event window. This pattern is not evident within the other group, indeed, although a slight increase compare to the days before the event, does not register significant increments.

Graph 7: Comparative graph of the Cumulative Average Abnormal Return of companies with an above industry- Asset Turnover ratio median and with a below – industry median Asset Turnover ratio.

This graph show the CAAR, computed using the Carhart Model (3FF + mom) and Three Fama Factor Model (3FF), for firm with a Asset Turnover Ratio under the industry median - represented by the line labeled Under - and those above the median – represented by the line labeled Above- over the event window [-10; + 10].



5.3 Exit Quality

As highlighted in the literature review, the CEO is one of the most critical role within the company. A leadership change might lead to a change in the company strategy direction, causing mutation in the firm's performance and operation. Consequently, the entrance of a new CEO in the office can significantly impact the current and the expected market value of the company. Additionally, within the company, the CEO is the most externally exposed role, and his reputation is directly connected with the company's image and reliability. Accordingly, a CEO substitution is a delicate process, and the quality of the relationship between this figure and the firm at the time of departure might influence the way investors perceive the event. A non-friendly departure might signal uncertainty and internal problems, which could then be reflected in stock market fluctuations.

The findings of this analysis support these assumptions. Indeed, as it exhibited in table 9, there is a significant difference in the market response to a leadership change when the relationship with the CEO ended on good terms or not, especially in the days after the event.

Focusing on the first part of the event window, from day -10 to day -5, there does not appear to be a significant difference between the two patterns. However, the scenario changes from day -5 onward**.** Companies where the CEO left on a non-amicable terms recorded a decline in CAR values, indicating a climate of uncertainty in the market regarding the company's future valuation. The CAARs for the event day and the two preceding days **(**CAAR (-10; -2), CAAR (-10; -1), CAAR (-10; 0)**)** are negative**.** However, this negative trend does not seems to have high magnitude or statistical significance. Additionally, these negative values are not verified by the analysis made using the CARhat model, where the trend is negative but does not fall

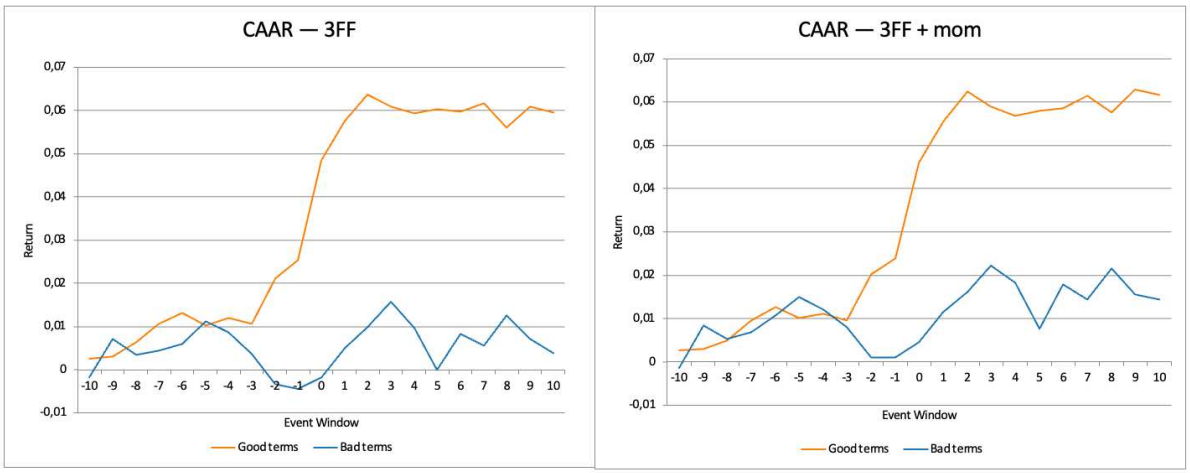
below zero. In the days following the event, the pattern remains similar, with moments of recovery (especially in the three days after the event) and moments of decline**.**

Meanwhile, companies where the CEO's departure was on good terms registered on average positive CAARs**,** with no sharp drops. This could suggest that, unlike the other group, these firms spread less uncertainty in the market. It is interesting observe the sharp increase in CAARs immediately after the event**,** peaking on day +3 at 6.09%**,** 4.50 percentage points higher than the other group.

These findings suggest that the nature of the CEO's departure influences stock market reactions and is therefore a factor that firms should carefully consider when are experiencing a leadership transition.

Graph 8: Comparative graph of the Cumulative Average Abnormal Return of companies characterized by a healthy CEO's departure, and companies with a unhealthy CEO's departure.

This graph shows the Cumulative Average Abnormal Return (CAAR), computed using the Carhart Model (3FF + mom) and Three Fama Factor Model (3FF), for company where the CEO's departure was on good terms - represented by the line labeled “good terms”- and for the company where the CEO's departure was on bad terms - represented by the line labeled “bad terms”. Over the event window [-10; + 10].



5.4 Industry

The magnitude and direction of the impact that a corporate event has on the stock market can vary across industries. Some industries tend to be more sensitive than others, either always or in response to specific events.

The findings of this study confirm the different sensitivity levels across industries when a CEO transition occurs and, to some extent, support the initial assumptions of this analysis.

The industrial sector recorded a significant market reaction, as exhibit in Table 9. Likely, as hypothesized, since the industrial sector is more static compared to others, CEO changes are less frequent. Consequently, when a CEO transition does occur, the market reacts strongly. Regarding the direction of the reaction, the industrial sector generally reports positive CAARs, with a peak in the days following the event.

A similar reaction is reported in the financial services sector. Differently to what we previously assumed, the reaction is significant and characterized by notable fluctuations. In general, in terms of direction, all CAARs are positive. The magnitude of this reaction and its fluctuations may be influenced by some additional factors that we have omitted. Despite the highly regulated nature of the financial sector, that limits the decision-making autonomy of CEOs, the market response is greater than we expected.
An example of factor that may contribute to this stronger than expected reaction is the popularity of the CEO. Some CEOs indeed have gained strong recognition and fame over the years, such as the current CEO of JPMorgan Jamie Dimon, and the current CEO of Berkshire Hathaway Warren Buffett. Especially in these situations, as previously mentioned, a CEO's reputation is directly connected to the company's image and credibility, and as a result, their replacement can trigger a strong market reaction.
However, the situation of a famous CEO is a specific scenario, not that common, so it is not sufficient to explain the overall strong market reaction in the financial service industry. This suggest that other factors might also contribute to this response.

Focusing on the healthcare industry, its reaction is particularly significant, showing the most pronounced market response among all sectors. Here too, CAARs remain positive throughout the analyzed time span. This strong positive reaction could be attributed to the fact that, in this sector, almost all new projects and scientific development require significant capital investment. Thus, before a CEO's transaction, the investor might anticipate the possibility that, with a new leadership, a new project could be implemented, increasing the expectation of future value of the company.

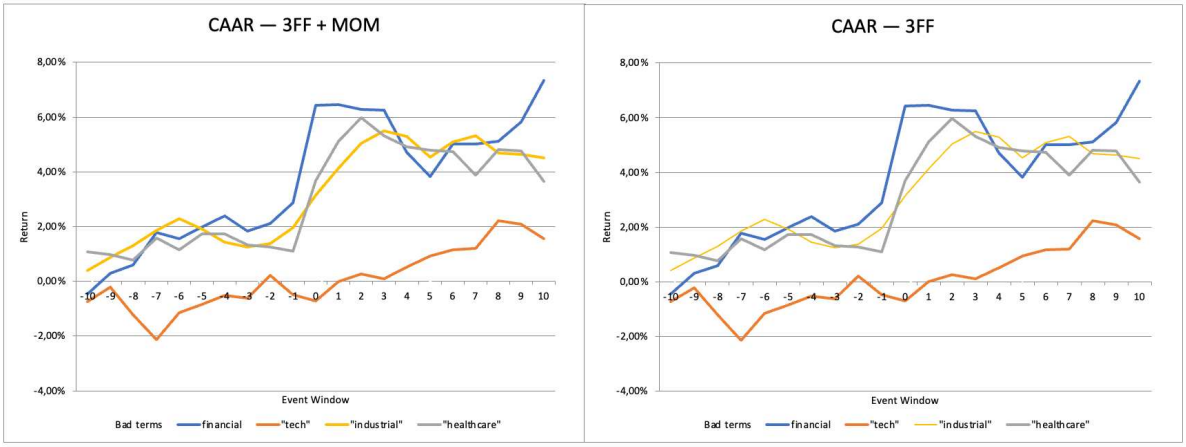
The tech industry, on the other hand, is the only sector to report negative CAAR values. For most of the days leading up to the event, companies in this sector showed negative CARs

values. Additionally, the CAARs pattern is not stable but highly volatile, and in general, the statistical significance of the reaction is not strong across the entire event window. This high volatility and negative values might be explained by uncertainty. The CEO of a tech company usually have significant freedom in directing the business strategy, this means that when a new CEO enter in the company the strategy of the company could be incur in significant change, this could lead uncertainty in the investor's expectations. At the same time, tech sector is highly dynamic and constantly evolving. This continuous changes and developments within this industry could be one of the reason of the the low significance of the reaction. Since the capital market is accustomed to frequent shifts in the tech industry, its reaction to CEO changes may be less pronounced compared to more static industries, as demonstrated by the contrast between the tech and industrial sectors.

Given these findings, it appears that a CEO transitions generate different impacts depending on the industry in which they occur. This conclusion is also supported by the findings obtained with the implementation of the Carhart Model, as it possible to observed at table 11 and graph 10.

Graph 9: Comparative graph of the Cumulative Average Abnormal Return of companies belonging to Tech, Industrial, Healthcare and Financial Service industries.

This graph exhibits the CAARs, computed using Three Fama Factor Model (3FF) and Carhart Model (3FF + mom), dividing the sample in 4 groups: Tech, Industrial, Healthcare and Financial Service industries.



6 CONCLUSION

The findings of this research suggest that the event of CEO replacement has a notable effect on the financial market. This corroborates the importance of the CEO role within the company. Conclusion that aligns with the previous studies mentioned in this research. Indeed, regardless of the different factors examined, overall, the CEO transaction caused movements in the market, which we gathered using cumulative abnormal returns. As already mentioned, the entrance of a new CEO can lead to changes in corporate management and in the strategic direction.

Although, for each scenario studied the market response differed in magnitude and significance, most of the reactions of the different subgroups tended to be consistently positive. Thus, on average, we can say that in the presence of a leadership change event, the general market reaction is positive, meaning that regardless of the factors we studied, market agents perceive the management change, as a positive event that can lead to an increment in the future market value of the company.

Another recurring pattern observed in most of the scenarios studied is that the market's response is stronger in the days following the event rather than in the days preceding it. Furthermore, the only negative data recorded, belong to the time window prior to the event. This suggests a a sort of distinction between two phases: the first, pre-event, where the market shows a poor reaction and in singular cases negative, a second phase, post-event where the market reaction is more significant and positive.

Moreover, the analysis of the relationship between the company-specific characteristics, captured through the use of financial ratios, and the influence of the CEO substitution on the market reveals how, each of these features of the company is used by investors to shape future expectations regarding the company.

Adittionally, beside the financial health of the company, the quality of termination of the relationship between the ceo and the company is also used as a criterion by investors to create their own forecast of future performance. This factor significantly influences market perception of the event. The outputs suggest that investors tend to evaluate the event less positively when the company experiences an abrupt termination of the of the employment relationship. Probably perceiving it as a signal of instability and internal issues.

The study of the effect across industries shows how, depending on the company's industry, the intensity of the market impact can vary. The difference in impact between the tech sector and the other sectors examined stands out.

In conclusion, the CEO turnover is proven to be an event that affects the market, mostly in a positive way, across all the factors explored in this research.

7 LIMITATIONS

There are few limitations in this analysis that might make the results found less reliable.
The first one relates to the market factors external to the company. Indeed, to fully investigate the relationship between the event studied, the market response connected, possible external factors such as crises, political and legislative events, should be taken into consideration to avoid distorting the analysis. This is especially when the period in which the event occurred is not the same but differs from company to company covering a time span of 25 years, and when the companies do not belong to the same industry.
A partial solution to this issue, i.e. the presence of external agents interfering in the study, was the choice to take the industry median of each individual company in the same year as the benchmark for comparison. However, this factor remains a quite limitation to the analysis, and to mitigate it further in future research, macroeconomic factors such as market volatility and others would be incorporated into the analysis.

Another limitation is the is the potential issue of endogeneity. The relationship between therefore CEO turnover and market reaction could be bidirectional, while CEO substitution impacts market performance, market performance itself could also be a decisive factor in the CEO turnover decision. To have more reliable findings, future analyses should implement analysis methods that also study the relationship, which we have studied as cause-effect in reverse.

Lastly another limitation is the size of the sample, which consists of 163 companies. As a result, it is not possible to determine whether the findings are applicable only to these 163 companies or if they have broader validity. Therefore, we would need to extend our sample to have more reliable outputs.

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9 APPENDIX

Table 2:

This table exhibits the CAAR of the entire sample computed within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

	EVENT WINDOW	OBS	3 FF	3 FF + MOM
CAAR	[-10 ; -10]	164	0,06%	0,09%
	[-10; -9]	164	0,49%	0,53%
	[-10; -8]	164	0,52%	0,51%
	[-10; -7]	164	0,79% *	0,84% *
	[-10; -6]	164	1,00% *	1,19% **
	[-10; -5]	164	1,07% *	1,23% **
	[-10; -4]	164	1,05%	1,15%
	[-10; -3]	164	0,76%	0,89%
	[-10; -2]	164	1,04%	1,19%
	[-10; -1]	164	1,23% *	1,38% *
	[-10; 0]	164	2,65% **	2,78% **
	[-10; 1]	164	3,46% ***	3,62% ***
	[-10; 2]	164	4,01% ***	4,21% ***
	[-10; 3]	164	4,12% ***	4,28% ***
	[-10; 4]	164	3,77% ***	4,00% ***
	[-10; 5]	164	3,39% **	3,60% **
	[-10; 6]	164	3,73% ***	4,08% ***
	[-10; 7]	164	3,71% **	4,08% ***
	[-10; 8]	164	3,71% **	4,18% ***
	[-10; 9]	164	3,73% **	4,22% **
	[-10; 10]	164	3,51% **	4,10% **

Table 3:

Comparative table of companies with a level of Return on Equity higher that industry median and companies with a lower level. For each group this table exhibits the CAARs, predicted with Three Fama French Model and Carhart Model, within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

	Three Fama-French Factor Model					Carhat Model				
EVENT WINDOW	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff
[-10 ; -10]	95	0,40%	60	-0,34%	0,73%	95	0,45%	60	-0,51%	0,96%
[-10; -9]	95	0,22%	60	1,18%	-0,96%	95	0,33%	60	0,84%	-0,51%
[-10; -8]	95	0,51%	60	0,85%	-0,34%	95	0,75%	60	0,49%	0,27%
[-10; -7]	95	1,05%	60	1,04%	0,00%	95	1,19% **	60	0,61%	0,58%
[-10; -6]	95	1,21%	60	1,44%	-0,23%	95	1,31% **	60	0,73%	0,58%
[-10; -5]	95	1,48%	60	1,13%	0,35%	95	1,63% **	60	0,37%	1,26%
[-10; -4]	95	1,31%	60	1,19%	0,12%	95	1,53% *	60	0,52%	1,01%
[-10; -3]	95	1,11%	60	0,86%	0,25%	95	1,23%	60	0,25%	0,98%
[-10; -2]	95	1,23%	60	1,45%	-0,23%	95	1,35%	60	0,79%	0,56%
[-10; -1]	95	1,45%	60	1,81%	-0,37%	95	1,60% *	60	1,11%	0,49%
[-10; 0]	95	3,57%	60	2,33%	1,23%	95	3,79% ***	60	1,64%	2,16%
[-10; 1]	95	4,05%	60	3,49%	0,56%	95	4,20% ***	60	2,86%	1,34%
[-10; 2]	95	4,24% *	60	4,55% *	-0,30%	95	4,30% ***	60	3,95%	0,35%
[-10; 3]	95	4,43% *	60	4,63% *	-0,19%	95	4,46% ***	60	4,14% *	0,31%
[-10; 4]	95	3,88% **	60	4,73% **	-0,85%	95	3,92% **	60	4,02% *	-0,10%
[-10; 5]	95	3,38% *	60	4,33% *	-0,95%	95	3,44% *	60	3,64%	-0,20%
[-10; 6]	95	3,48% *	60	5,41% *	-1,93%	95	3,36% *	60	4,64% *	-1,29%
[-10; 7]	95	3,46% *	60	5,47% *	-2,00%	95	3,26% *	60	4,74% *	-1,48%
[-10; 8]	95	3,24% **	60	6,24% **	-3,00%	95	2,94%	60	5,41% **	-2,47%
[-10; 9]	95	3,69% *	60	5,89% *	-2,19%	95	3,35% *	60	5,09% *	-1,73%
[-10; 10]	95	3,77% *	60	5,43%	-1,65%	95	3,32%	60	4,52%	-1,20%

Table 4:

Comparative table of companies with a Return on Asset level higher that industry median and companies with a lower level. For each group this table exhibits the CAARs, predicted with Three Fama French Model and Carhart Model, within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

	Three Fama-French Factor Model					Carhat Model				
EVENT WINDOW	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff
[-10 ; -10]	89	0,66% **	62	-0,74%	1,40% **	89	0,69% **	62	-0,71%	1,40% **
[-10; -9]	89	0,66% *	62	0,34%	0,32%	89	0,63% *	62	0,52%	0,12%
[-10; -8]	89	1,03% **	62	0,11%	0,92%	89	0,94% *	62	0,21%	0,73%
[-10; -7]	89	1,44% ***	62	0,29%	1,15%	89	1,42% **	62	0,50%	0,92%
[-10; -6]	89	1,85% ***	62	0,00%	1,85%	89	1,86% ***	62	0,49%	1,37%
[-10; -5]	89	2,01% ***	62	-0,10%	2,11%	89	1,97% ***	62	0,44%	1,53%
[-10; -4]	89	2,01% ***	62	-0,12%	2,13%	89	1,92% ***	62	0,31%	1,61%
[-10; -3]	89	1,99% **	62	-0,77%	2,75%	89	1,98% **	62	-0,37%	2,34%
[-10; -2]	89	2,21% **	62	-0,41%	2,62%	89	2,17% **	62	0,08%	2,10%
[-10; -1]	89	2,10% **	62	0,43%	1,67%	89	2,03% **	62	0,96%	1,07%
[-10; 0]	89	4,62% ***	62	0,59%	4,03%	89	4,54% ***	62	1,02%	3,52%
[-10; 1]	89	5,30% ***	62	1,37%	3,92%	89	5,20% ***	62	1,88%	3,32%
[-10; 2]	89	5,34% ***	62	2,48%	2,85%	89	5,27% ***	62	3,05%	2,23%
[-10; 3]	89	5,55% ***	62	2,60%	2,94%	89	5,51% ***	62	3,06%	2,45%
[-10; 4]	89	5,60% ***	62	1,61%	3,99%	89	5,52% ***	62	2,31%	3,21%
[-10; 5]	89	5,26% ***	62	1,02%	4,25%	89	5,18% ***	62	1,68%	3,50%
[-10; 6]	89	5,19% ***	62	1,93%	3,26%	89	5,16% ***	62	2,88%	2,28%
[-10; 7]	89	5,36% ***	62	1,63%	3,73%	89	5,30% ***	62	2,70%	2,61%
[-10; 8]	89	5,55% ***	62	1,51%	4,04%	89	5,62% ***	62	2,63%	2,99%
[-10; 9]	89	5,76% ***	62	1,51%	4,25%	89	5,83% ***	62	2,68%	3,14%
[-10; 10]	89	5,58% ***	62	1,20%	4,38% *	89	5,71% ***	62	2,54%	3,17%

Table 5:

Comparative table of companies with a level Total Debt-to-Equity Ratio higher that industry median and companies with a lower level. For each group this table exhibits the CAARs, predicted with Three Fama French Model and Carhart Model, within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

	Three Fama-French Factor Model					Carhat Model				
EVENT WINDOW	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff
[-10 ; -10]	91	0,16%	60	-0,02%	0,18%	91	0,18%	60	0,01%	0,17%
[-10; -9]	91	0,70% *	60	0,28%	0,41%	91	0,84% **	60	0,20%	0,64%
[-10; -8]	91	0,43%	60	0,98%	-0,56%	91	0,51%	60	0,83%	-0,32%
[-10; -7]	91	0,81%	60	1,21%	-0,41%	91	1,01%	60	1,10%	-0,09%
[-10; -6]	91	0,71%	60	1,67% *	-0,95%	91	1,04%	60	1,68%	-0,63%
[-10; -5]	91	0,84%	60	1,60%	-0,75%	91	1,19%	60	1,58%	-0,39%
[-10; -4]	91	0,71%	60	1,79%	-1,07%	91	0,90%	60	1,81%	-0,91%
[-10; -3]	91	0,32%	60	1,67%	-1,36%	91	0,57%	60	1,69%	-1,12%
[-10; -2]	91	0,38%	60	2,28%	-1,90%	91	0,69%	60	2,26%	-1,56%
[-10; -1]	91	0,79%	60	2,35%	-1,56%	91	1,14%	60	2,27%	-1,13%
[-10; 0]	91	2,25%	60	4,05% **	-1,80%	91	2,59% *	60	3,86% *	-1,27%
[-10; 1]	91	2,74% *	60	5,12% **	-2,38%	91	3,10% **	60	4,95% **	-1,84%
[-10; 2]	91	3,15% *	60	5,71% ***	-2,56%	91	3,62% **	60	5,48% **	-1,87%
[-10; 3]	91	3,10% *	60	6,22% ***	-3,12%	91	3,62% **	60	5,85% ***	-2,23%
[-10; 4]	91	2,61%	60	6,00% ***	-3,39%	91	3,19% *	60	5,74% ***	-2,55%
[-10; 5]	91	1,82%	60	6,10% ***	-4,28%	91	2,34%	60	5,87% ***	-3,54%
[-10; 6]	91	2,17%	60	6,40% ***	-4,23%	91	2,79%	60	6,40% ***	-3,61%
[-10; 7]	91	1,97%	60	6,65% ***	-4,68%	91	2,64%	60	6,64% ***	-4,00%
[-10; 8]	91	2,49%	60	6,01% ***	-3,52%	91	3,28%	60	6,08% ***	-2,80%
[-10; 9]	91	1,99%	60	7,09% ***	-5,09%	91	2,80%	60	7,17% ***	-4,38%
[-10; 10]	91	1,67%	60	6,99% ***	-5,32% *	91	2,61%	60	7,13% ***	-4,53% *

Table 6:

Comparative table of companies with a level Price-to-Earnings Ratio higher that industry median and companies with a lower level. For each group this table exhibits the CAARs, predicted with Three Fama French Model and Carhart Model, within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

	Three Fama-French Factor Model					Carhat Model				
EVENT WINDOW	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff
[-10 ; -10]	93	0,01%	58	0,21%	-0,20%	93	0,01%	58	0,28%	-0,27%
[-10; -9]	93	0,26%	58	0,96%	-0,70%	93	0,24%	58	1,14%	-0,90%
[-10; -8]	93	0,53%	58	0,83%	-0,30%	93	0,42%	58	0,99%	-0,56%
[-10; -7]	93	0,27%	58	2,09% **	-1,82%	93	0,24%	58	2,34% **	-2,10% *
[-10; -6]	93	0,77%	58	1,60%	-0,82%	93	0,86%	58	2,00%	-1,14%
[-10; -5]	93	0,75%	58	1,77%	-1,01%	93	0,82%	58	2,18% *	-1,35%
[-10; -4]	93	0,70%	58	1,84%	-1,14%	93	0,68%	58	2,19%	-1,50%
[-10; -3]	93	0,20%	58	1,90%	-1,70%	93	0,20%	58	2,32%	-2,12%
[-10; -2]	93	0,33%	58	2,43%	-2,11%	93	0,33%	58	2,90% *	-2,57%
[-10; -1]	93	0,83%	58	2,34%	-1,51%	93	0,84%	58	2,78%	-1,94%
[-10; 0]	93	2,33%	58	3,98% **	-1,65%	93	2,25%	58	4,44% **	-2,19%
[-10; 1]	93	3,48% **	58	4,02% *	-0,54%	93	3,52% **	58	4,34% *	-0,81%
[-10; 2]	93	3,68% **	58	4,95% **	-1,28%	93	3,84% **	58	5,20% **	-1,36%
[-10; 3]	93	3,97% **	58	4,93% **	-0,97%	93	4,10% **	58	5,16% **	-1,06%
[-10; 4]	93	4,01% **	58	3,88%	0,13%	93	4,09% **	58	4,39% *	-0,30%
[-10; 5]	93	3,62% *	58	3,36%	0,26%	93	3,63% **	58	3,92%	-0,28%
[-10; 6]	93	3,52% *	58	4,38% *	-0,85%	93	3,68% *	58	5,09% *	-1,41%
[-10; 7]	93	3,34%	58	4,61% *	-1,28%	93	3,55% *	58	5,32% *	-1,77%
[-10; 8]	93	3,50% *	58	4,52%	-1,02%	93	3,84% *	58	5,28% *	-1,43%
[-10; 9]	93	3,57%	58	4,74% *	-1,17%	93	3,95% *	58	5,48% *	-1,53%
[-10; 10]	93	2,78%	58	5,39% **	-2,61%	93	3,24%	58	6,28% **	-3,04%

Table 7:

Comparative table of companies with a level Current Ratio higher that industry median and companies with a lower level. For each group this table exhibits the CAARs, predicted with Three Fama French Model and Carhart Model, within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

	Three Fama-French Factor Model					Carhat Model				
EVENT WINDOW	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff
[-10 ; -10]	54	0,69%	77	-0,14%	0,83%	54	0,61%	77	-0,07%	0,68%
[-10; -9]	54	0,87%	77	0,44%	0,44%	54	0,80%	77	0,51%	0,28%
[-10; -8]	54	0,42%	77	0,92%	-0,51%	54	0,26%	77	0,91%	-0,65%
[-10; -7]	54	0,31%	77	1,44% **	-1,13%	54	0,23%	77	1,41% **	-1,18%
[-10; -6]	54	0,92%	77	1,37% *	-0,46%	54	1,05%	77	1,39% *	-0,34%
[-10; -5]	54	0,46%	77	1,57% *	-1,10%	54	0,65%	77	1,54% *	-0,89%
[-10; -4]	54	-0,08%	77	1,84% **	-1,92%	54	0,03%	77	1,72% *	-1,69%
[-10; -3]	54	-0,67%	77	1,93% **	-2,60%	54	-0,58%	77	1,82% *	-2,40%
[-10; -2]	54	-0,97%	77	2,70% ***	-3,67% *	54	-0,87%	77	2,59% **	-3,46%
[-10; -1]	54	-0,63%	77	2,75% ***	-3,39%	54	-0,45%	77	2,58% **	-3,02%
[-10; 0]	54	-0,14%	77	4,85% ***	-4,99% *	54	-0,01%	77	4,58% ***	-4,59% *
[-10; 1]	54	1,93%	77	4,93% ***	-3,00%	54	2,09%	77	4,65% ***	-2,56%
[-10; 2]	54	2,88%	77	5,23% ***	-2,36%	54	3,03%	77	5,05% ***	-2,02%
[-10; 3]	54	2,91%	77	5,56% ***	-2,65%	54	3,08%	77	5,32% ***	-2,23%
[-10; 4]	54	3,08%	77	5,36% ***	-2,28%	54	3,33%	77	5,06% ***	-1,73%
[-10; 5]	54	2,86%	77	4,99% ***	-2,12%	54	2,85%	77	4,75% ***	-1,90%
[-10; 6]	54	2,78%	77	5,42% ***	-2,65%	54	2,76%	77	5,38% ***	-2,62%
[-10; 7]	54	2,39%	77	5,74% ***	-3,35%	54	2,39%	77	5,68% ***	-3,29%
[-10; 8]	54	3,27%	77	5,24% ***	-1,97%	54	3,17%	77	5,39% ***	-2,22%
[-10; 9]	54	2,84%	77	5,70% ***	-2,86%	54	2,73%	77	5,80% ***	-3,06%
[-10; 10]	54	1,87%	77	5,54% ***	-3,67%	54	1,86%	77	5,68% ***	-3,82%

Table 8:

Comparative table of companies with a level Asset turnover higher that industry median and companies with a lower level. For each group this table exhibits the CAARs, predicted with Three Fama French Model and Carhart Model, within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

	Three Fama-French Factor Model					Carhat Model				
EVENT WINDOW	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff
[-10 ; -10]	78	0,25%	73	-0,09%	0,34%	78	0,27%	73	-0,06%	0,33%
[-10; -9]	78	0,37%	73	0,70%	-0,33%	78	0,43%	73	0,75%	-0,31%
[-10; -8]	78	0,72% *	73	0,57%	0,15%	78	0,75% *	73	0,52%	0,23%
[-10; -7]	78	0,79%	73	1,16%	-0,37%	78	0,89%	73	1,21%	-0,33%
[-10; -6]	78	1,01%	73	1,18%	-0,17%	78	1,23% *	73	1,36%	-0,13%
[-10; -5]	78	1,35% *	73	0,93%	0,42%	78	1,58% **	73	1,09%	0,49%
[-10; -4]	78	1,37%	73	0,89%	0,48%	78	1,45% *	73	1,06%	0,40%
[-10; -3]	78	0,81%	73	0,91%	-0,10%	78	0,94%	73	1,10%	-0,16%
[-10; -2]	78	0,80%	73	1,49%	-0,69%	78	0,96%	73	1,69%	-0,73%
[-10; -1]	78	1,13%	73	1,72%	-0,59%	78	1,29%	73	1,90%	-0,62%
[-10; 0]	78	1,48%	73	4,56% **	-3,08%	78	1,70%	73	4,58% **	-2,87%
[-10; 1]	78	1,74%	73	5,77% ***	-4,03%	78	2,02% *	73	5,78% **	-3,76%
[-10; 2]	78	2,08%	73	6,39% ***	-4,31%	78	2,39% *	73	6,46% ***	-4,07%
[-10; 3]	78	2,06%	73	6,77% ***	-4,71% *	78	2,47% *	73	6,68% ***	-4,21%
[-10; 4]	78	1,58%	73	6,50% ***	-4,93% *	78	2,03%	73	6,52% ***	-4,49%
[-10; 5]	78	0,91%	73	6,31% **	-5,41% *	78	1,36%	73	6,28% **	-4,92%
[-10; 6]	78	1,23%	73	6,64% **	-5,41% *	78	1,78%	73	6,83% **	-5,05%
[-10; 7]	78	1,44%	73	6,38% **	-4,94%	78	2,04%	73	6,57% **	-4,53%
[-10; 8]	78	1,72%	73	6,21% **	-4,50%	78	2,50%	73	6,42% **	-3,93%
[-10; 9]	78	2,22%	73	5,94% **	-3,72%	78	2,94%	73	6,24% **	-3,30%
[-10; 10]	78	1,78%	73	5,92% *	-4,13%	78	2,58%	73	6,35% *	-3,77%

Table 9

Comparative table of companies where the CEO's departure was on good terms and for the company where the CEO's departure was on bad terms. For each group this table exhibits the CAARs, predicted with Three Fama French Model and Carhart Model, within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

	Three Fama-French Factor Model					Carhat Model				
EVENT WINDOW	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff	Obs Above	CAAR Above	Obs Below	CAAR Below	Diff
[-10 ; -10]	91	0,25%	71	-0,18%	0,43%	91	0,26%	71	-0,13%	0,39%
[-10; -9]	91	0,31%	71	0,73%	-0,42%	91	0,29%	71	0,84%	-0,55%
[-10; -8]	91	0,65%	71	0,35%	0,30%	91	0,50%	71	0,53%	-0,04%
[-10; -7]	91	1,06% *	71	0,44%	0,62%	91	0,96%	71	0,70%	0,26%
[-10; -6]	91	1,32% *	71	0,60%	0,72%	91	1,28% *	71	1,08%	0,19%
[-10; -5]	91	1,02%	71	1,13%	-0,11%	91	1,01%	71	1,51%	-0,49%
[-10; -4]	91	1,20%	71	0,87%	0,33%	91	1,11%	71	1,20%	-0,10%
[-10; -3]	91	1,06%	71	0,37%	0,69%	91	0,97%	71	0,80%	0,17%
[-10; -2]	91	2,12% *	71	-0,34%	2,46%	91	2,03% *	71	0,11%	1,92%
[-10; -1]	91	2,54% **	71	-0,45%	2,99%	91	2,38% *	71	0,10%	2,28%
[-10; 0]	91	4,86% ***	71	-0,18%	5,03% **	91	4,60% ***	71	0,45%	4,15% *
[-10; 1]	91	5,76% ***	71	0,51%	5,25% **	91	5,55% ***	71	1,15%	4,40% *
[-10; 2]	91	6,38% ***	71	0,99%	5,39% **	91	6,24% ***	71	1,61%	4,64% *
[-10; 3]	91	6,09% ***	71	1,59%	4,50% *	91	5,89% ***	71	2,22%	3,67%
[-10; 4]	91	5,94% ***	71	0,98%	4,97% *	91	5,68% ***	71	1,83%	3,85%
[-10; 5]	91	6,03% ***	71	0,00%	6,03% **	91	5,80% ***	71	0,77%	5,03% *
[-10; 6]	91	5,98% ***	71	0,84%	5,14% *	91	5,86% ***	71	1,79%	4,07%
[-10; 7]	91	6,18% ***	71	0,55%	5,63% *	91	6,15% ***	71	1,44%	4,71%
[-10; 8]	91	5,62% ***	71	1,26%	4,36%	91	5,75% ***	71	2,16%	3,59%
[-10; 9]	91	6,08% ***	71	0,71%	5,37%	91	6,28% ***	71	1,57%	4,72%
[-10; 10]	91	5,95% ***	71	0,39%	5,56%	91	6,17% ***	71	1,45%	4,72%

Table 10

Comparative table of companies belongs to: Tech, Industrial, Healthcare and Financial Service. For each group this table exhibits the CAARs, predicted with Three Fama French Model within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

EVENT WINDOW	Obs Above	CAAR Tech	Obs Industrial	CAAR Industrial	Obs Finacial	CAAR Financial	Obs Healthcare	CAAR Healthcare
[-10 ; -10]	39	-0,74%	76	0,36%	24	-0,61%	23	1,13% **
[-10; -9]	39	-0,10%	76	0,79% *	24	0,04%	23	0,97% *
[-10; -8]	39	-0,93%	76	1,23% **	24	0,27%	23	0,86% *
[-10; -7]	39	-1,75%	76	1,78% ***	24	1,06%	23	1,55% *
[-10; -6]	39	-1,18%	76	2,20% ***	24	0,69%	23	1,08%
[-10; -5]	39	-0,75%	76	1,79% **	24	1,20%	23	1,62%
[-10; -4]	39	-0,42%	76	1,42%	24	1,67%	23	1,70%
[-10; -3]	39	-0,46%	76	1,13%	24	0,89%	23	1,44%
[-10; -2]	39	0,47%	76	1,19%	24	1,09%	23	1,48%
[-10; -1]	39	-0,23%	76	1,78%	24	1,88%	23	1,19%
[-10; 0]	39	-0,47%	76	3,05% *	24	5,34% *	23	3,83%
[-10; 1]	39	0,25%	76	4,00% **	24	5,29% *	23	5,17%
[-10; 2]	39	0,57%	76	4,85% ***	24	5,08%	23	5,98%
[-10; 3]	39	0,42%	76	5,36% ***	24	5,06%	23	5,29%
[-10; 4]	39	0,60%	76	5,23% ***	24	3,01%	23	5,09%
[-10; 5]	39	1,05%	76	4,58% **	24	1,89%	23	4,97%
[-10; 6]	39	1,15%	76	5,03% **	24	2,75%	23	4,79%
[-10; 7]	39	1,25%	76	5,24% **	24	2,52%	23	4,09%
[-10; 8]	39	2,28%	76	4,51% **	24	2,47%	23	4,76%
[-10; 9]	39	2,22%	76	4,43% *	24	2,96%	23	4,78%
[-10; 10]	39	1,66%	76	4,25%	24	4,07%	23	3,63%

Table 11

Comparative table of the difference in CAARs between companies belonging to the following sectors: Tech, Industrial, Healthcare, and Financial Services, grouped in pairs of two.

For each group this table exhibits the CAARs, predicted with Three Fama French Model within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

EVENT WINDOW	Diff Industrial - Tech	Diff Financial - Tech	Diff Healthcare- Tech	Diff Industrial - Financial	Diff industrial-healthcare	Diff healthcare - financial
[-10 ; -10]	1,10%	0,13%	1,87% *	0,97%	-0,77%	1,74% **
[-10; -9]	0,89%	0,14%	1,07%	0,75%	-0,18%	0,93%
[-10; -8]	2,17% **	1,21%	1,80% *	0,96%	0,37%	0,59%
[-10; -7]	3,52% **	2,80%	3,30% **	0,72%	0,22%	0,50%
[-10; -6]	3,38% **	1,87%	2,26%	1,51%	1,12%	0,39%
[-10; -5]	2,53%	1,95%	2,36%	0,59%	0,17%	0,42%
[-10; -4]	1,84%	2,09%	2,12%	-0,25%	-0,28%	0,03%
[-10; -3]	1,59%	1,35%	1,90%	0,25%	-0,31%	0,55%
[-10; -2]	0,73%	0,62%	1,01%	0,10%	-0,28%	0,39%
[-10; -1]	2,01%	2,11%	1,42%	-0,09%	0,59%	-0,69%
[-10; 0]	3,52%	5,81%	4,30%	-2,29%	-0,78%	-1,51%
[-10; 1]	3,75%	5,04%	4,92%	-1,29%	-1,17%	-0,12%
[-10; 2]	4,29%	4,51%	5,41%	-0,22%	-1,13%	0,90%
[-10; 3]	4,94%	4,63%	4,86%	0,31%	0,08%	0,23%
[-10; 4]	4,63%	2,41%	4,50%	2,22%	0,14%	2,08%
[-10; 5]	3,53%	0,84%	3,92%	2,69%	-0,39%	3,09%
[-10; 6]	3,88%	1,60%	3,63%	2,29%	0,25%	2,04%
[-10; 7]	3,98%	1,26%	2,83%	2,72%	1,15%	1,57%
[-10; 8]	2,23%	0,18%	2,47%	2,05%	-0,24%	2,29%
[-10; 9]	2,22%	0,75%	2,56%	1,47%	-0,35%	1,82%
[-10; 10]	2,59%	2,41%	1,97%	0,18%	0,62%	-0,44%

Table 12

Comparative table of companies belongs to: Tech, Industrial, Healthcare and Financial Service. For each group this table exhibits the CAARs, predicted with Carhat Model, within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

EVENT WINDOW	Obs Above	CAAR Tech	Obs Industrial	'AAR Industri	Obs Finacial	CAAR Financial	Obs Healthcare	CAAR Healthcare
[-10 ; -10]	39	-0,74%	76	0,40%	24	-0,46%	23	1,07% *
[-10; -9]	39	-0,22%	76	0,86% **	24	0,29%	23	0,97% *
[-10; -8]	39	-1,21%	76	1,30% **	24	0,59%	23	0,77%
[-10; -7]	39	-2,14%	76	1,86% ***	24	1,77%	23	1,58% **
[-10; -6]	39	-1,16%	76	2,29% ***	24	1,55%	23	1,16%
[-10; -5]	39	-0,85%	76	1,91% **	24	1,98%	23	1,73%
[-10; -4]	39	-0,52%	76	1,44%	24	2,39%	23	1,73%
[-10; -3]	39	-0,63%	76	1,24%	24	1,85%	23	1,32%
[-10; -2]	39	0,22%	76	1,38%	24	2,10%	23	1,27%
[-10; -1]	39	-0,48%	76	1,96%	24	2,88%	23	1,10%
[-10; 0]	39	-0,71%	76	3,14% **	24	6,43% **	23	3,68%
[-10; 1]	39	0,00%	76	4,14% **	24	6,47% *	23	5,12%
[-10; 2]	39	0,27%	76	5,05% ***	24	6,28% *	23	5,98%
[-10; 3]	39	0,09%	76	5,49% ***	24	6,26% *	23	5,32%
[-10; 4]	39	0,51%	76	5,29% ***	24	4,71%	23	4,90%
[-10; 5]	39	0,93%	76	4,53% **	24	3,83%	23	4,78%
[-10; 6]	39	1,16%	76	5,09% **	24	5,02%	23	4,73%
[-10; 7]	39	1,20%	76	5,33% **	24	5,02%	23	3,89%
[-10; 8]	39	2,23%	76	4,69% **	24	5,12%	23	4,81%
[-10; 9]	39	2,08%	76	4,64% *	24	5,83%	23	4,77%
[-10; 10]	39	1,57%	76	4,51% *	24	7,35%	23	3,64%

Table 13

Comparative table of the difference in CAARs between companies belonging to the following sectors: Tech, Industrial, Healthcare, and Financial Services, grouped in pairs of two.

For each group this table exhibits the CAARs, predicted with Carhat Model within the entire event window [-10; + 10], starting from the AAR of day -10 and accumulating up to CAAR [-10; 10].

* t-test > 1,64; ** 1,64< t-test < 1,96; *** t-test > 2,58

EVENT WINDOW	Diff Industrial - Tech	Diff Financial - Tech	Diff Healthcare- Tech	Diff Industrial - Financial	Diff industrial-healthcare	Diff healthcare - financial
[-10 ; -10]	1,14%	0,28%	1,81% *	0,86%	-0,67%	1,53% **
[-10; -9]	1,09%	0,52%	1,19%	0,57%	-0,11%	0,68%
[-10; -8]	2,51% **	1,80%	1,99% *	0,71%	0,52%	0,18%
[-10; -7]	4,00% **	3,91% *	3,72% **	0,08%	0,28%	-0,19%
[-10; -6]	3,45% **	2,71%	2,32%	0,74%	1,13%	-0,39%
[-10; -5]	2,77%	2,83%	2,58%	-0,06%	0,18%	-0,25%
[-10; -4]	1,96%	2,91%	2,25%	-0,95%	-0,29%	-0,66%
[-10; -3]	1,87%	2,47%	1,94%	-0,60%	-0,07%	-0,53%
[-10; -2]	1,16%	1,89%	1,05%	-0,73%	0,11%	-0,84%
[-10; -1]	2,44%	3,36%	1,58%	-0,92%	0,86%	-1,78%
[-10; 0]	3,85%	7,13% *	4,39%	-3,28%	-0,54%	-2,74%
[-10; 1]	4,14%	6,47%	5,12%	-2,33%	-0,98%	-1,35%
[-10; 2]	4,78%	6,02%	5,72%	-1,23%	-0,94%	-0,30%
[-10; 3]	5,39% *	6,17%	5,23%	-0,77%	0,16%	-0,94%
[-10; 4]	4,78%	4,20%	4,39%	0,58%	0,38%	0,20%
[-10; 5]	3,60%	2,90%	3,85%	0,70%	-0,25%	0,95%
[-10; 6]	3,93%	3,86%	3,57%	0,07%	0,36%	-0,29%
[-10; 7]	4,13%	3,82%	2,69%	0,31%	1,44%	-1,13%
[-10; 8]	2,46%	2,90%	2,59%	-0,44%	-0,13%	-0,31%
[-10; 9]	2,56%	3,75%	2,70%	-1,19%	-0,14%	-1,05%
[-10; 10]	2,95%	5,78%	2,08%	-2,83%	0,87%	-3,70%