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The Effect of Executive Compensation Regulations on the Firm Performance

An Event Study on the Financial Market of the United States

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ABSTRACT

This paper aims to find the effects of regulations regarding executive compensation on the firm performance. The stock price is used as a proxy for firm performance. The study focuses on three SEC regulations and the Tax Excessive CEO Act. An event study with a three-day event window (-1,1) is performed to account for the abnormal return following the announcements and implementations of the regulations. Additionally, a panel data regression is performed to analyse the effects of the regulations on the level of executive compensation. The paper concludes that there is a small negative return in reaction to the implementation of the regulations. Companies paying a high executive compensation tend to react differently than companies paying a low executive compensation. Furthermore, the amount of executive compensation paid is increased due to the implementation of the Pay Ratio Disclosure.

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CHAPTER 1 Introduction

An important economic challenge worldwide is still payment inequality. The differences between the rich and the poor are huge and still growing. The extreme compensation executives of big companies are getting next to their regular wages is a big contribution to this inequality. In recent years, the payments executives receive, are getting more transparent. With this transparency, there has been a growing awareness on these extreme payments and their fairness. Next to this additional attention and criticism, there is also a growing number of regulations regarding executive compensation. The U.S. Security and Exchange Commission (SEC) set up some requirements for publicly traded companies. For example, from 2006 onwards, public companies are obligated to publish a proxy statement including the companies used as a peer group. Since 2022, the Pay-versus-Performance disclosure rules entered into force. These rules are supposed to give a more transparent view of the executive compensation paid to the CEO and other executives. The SEC is not the only organization implementing regulations. There have been multiple acts announced or already introduced aiming to fight the high executive compensations with tax regulations. It is, however, still questionable if these regulations do have the effect they are intended to have.

The field of executive compensation has been highly researched in different areas. With the complicated structures of executive compensation, principal-agent problems arise (Garen, 1994). Furthermore, the level of executive compensation is not only dependent on the performance of the firm but also, among others, on firm prestige and the power of the executive. (Focke et al., 2017, Song & Wan, 2019). Over the years, the regulations regarding executive compensation have been increased to diminish the principal-agent problems. However, these regulations did not always have the expected effects. The previous literature found some contrasting results with some legislations that did affect the level of executive compensation, whereas others did not see this effect (Correa & Lel, 2016, Chang et al., 2022). Furthermore, there has not been a unified answer on the effect of these regulations on executive compensation on firm performance. Depending on the market and regulations, some papers found a small negative return whereas others found a small positive return (Larcker et al., 2011, Cai & Walkling, 2011, Hitz & Müller-Bloch, 2015, Bae et al., 2017, Jiang & Zhang, 2018). When focusing on tax laws, it has been found that companies affected by those laws experience more negative returns than companies that are not affected (Bilicka et al., 2022, Zheng & He, 2022).

As previously discussed, there has been a lot of research on executive compensation. However, there is a lack of research on the regulations regarding executive compensation. There

has been some research on the effectiveness of these regulations, but there has not been a unified answer (Correa & Lel, 2016, Chang et al., 2022). Furthermore, there has been some research on the reaction of the financial market to regulations regarding executive compensation. However, this research is missing for the new regulations on the market of the United States ((Larcker et al., 2011, Cai & Walkling, 2011, Hitz & Müller-Bloch, 2015, Bae et al., 2017, Jiang & Zhang, 2018). This paper aims to fill this gap in the literature. It can be expected that the increase in the legislation on executive compensation will continue in the future since the desired results are not yet reached. The reaction of the firms, using their firm performance, on newly announced and implemented regulations, is very useful for both the legislator and the shareholders of a company and investors. Looking at multiple different regulations with a broad timeline from 2006 until 2022, a structured overview of the firm's reaction can be made. Legislators should consider this concerning their policies, and which type of regulation is more likely to reach the desired effect. Additionally, for the company, it is relevant to know in advance how the firm is going to react to the announcement and implementation of new legislation. Furthermore, it provides insight into the contributions to investors' confidence. The shareholders could be expected to gain from the regulations since less of the corporation's money should be directed to its executives. However, the regulations could also diminish the firm's efficiency and therefore lower the shareholders' profits. Furthermore, this paper is an addition to the literature by being the first paper to compare SEC regulations with tax-related regulations.

The following research question will be central to this study:

To what extent did the regulations regarding executive compensation have an effect on the firm performance of companies in the United States?

For this study, multiple regulatory acts will be considered. These will include the Proxy Statement Disclosure, the Pay Ratio Disclose, the Pay-versus-Performance Disclosure, and the Tax Excessive CEO Pay Act. The period considered is therefore 2005 until the end of 2022, to include the dates of all announcements and implementations. With the implementation of the Proxy Statement Disclosure, it became obligatory for companies to upload more information on their paid executive compensation. This would include which companies they used as a part of their peer group to determine the level of executive compensation. The Pay Ratio Disclosure expanded this proxy statement by making it mandatory to include the median of the compensation of all the employees of the companies and the compensation of the CEO, and the

ratio between the two. The Pay-versus-Performance Disclosure again extended the proxy statements by also including an overview of the compensation paid in previous years and corresponding financial performance in those years. The total shareholder return, the total shareholder returns of its peers, the net income, and a measure of choice are used as measures of performance. The Tax Excessive CEO Pay Act is a regulation focused on taxes. The income tax rate of companies paying excessive executive compensation will be increased by 0.5%. It is unclear, however, when this act will be implemented. The companies used for this study are the S&P500 companies. To test this research question, an event study will be performed. This study allows us to investigate the impact of an event on the value of a company. The stock price will be used as a measure of the value of the company. The date of both the announcement and the implementation of the regulations will be used as the date of the event used for the event study. This study will be performed in multiple different ways. At first, each regulation will be considered, then all the regulations will be put together to check with a greater sample. Lastly, the SEC regulations will be separated from the tax regulations accounting for an effect on the type of regulation. Additionally, a panel data regression will be performed to analyse the effects of the regulations on the amount of executive compensation paid.

An average CAR of -0,2% is found as a reaction to the implementation of all the regulations combined. The implementation of regulations regarding executive compensation is associated with a small negative abnormal return. There is no difference found between companies based on their quality of corporate governance. However, companies tend to react differently to the regulations based on the amount of executive compensation paid. However, it is still unclear in what direction they react differently. There is no difference found between the announcement of the SEC regulations and the tax regulation. Furthermore, the amount of executive compensation paid seems to be increased due to the Pay Ratio Disclosure.

The remainder of this paper will be structured as follows. Chapter 2 will include the theoretical framework for this study including multiple hypotheses. The data used will be discussed in Chapter 3, and the methodology used in Chapter 4. Chapter 5 will include the results of this study. This will be followed by a discussion in Chapter 6 and a conclusion in Chapter 7.

CHAPTER 2 Theoretical Framework

The following chapter will further elaborate on the previous research done in the field of executive compensation and regulations regarding executive compensation. The previous research will be discussed in combination with their results. This chapter will conclude with multiple hypotheses based on the discussed literature.

2.1 Previous Research

There has been extensive research on the topic of executive compensation. This paragraph will focus on the more general research on executive compensation, the role and function of regulations on this executive compensation, and lastly the effect of governmental regulations on firm performance.

2.1.1 Executive Compensation

There has been extensive research on the topic of executive compensation. The relationship between pay and performance is highly researched. In practice, the amount of the executive compensation is not a measure of firm performance. Part of the function of executive compensation is to align the incentives of the CEO with the firm. This would theoretically lead to an optimal-performing company. However, with these executive compensation structures, a principal-agent problem arises (Garen, 1994). Later research found different factors that are of influence on the amount of executive compensation. Focke et al (2017) did their research on the effect of firm prestige on the amount of executive compensation. The Fortune's MAC ranking is used as a way of measuring the firm's prestige for the S&P1500 companies. They perform multiple regression analyses in their research. Firms with the highest firm prestige on average pay their executives a compensation that is 8% lower than their less prestige peers. They conclude that managers are willing to trade off monetary compensation for status. Song & Wan (2019) did their research on the influence of managerial power on the amount of executive compensation for S&P500 companies. They used multiple control variables to account for the quality of corporate governance in their OLS regressions. Their findings show that managers with more power have higher executive compensation than managers with less power. This higher level of executive compensation is most likely due to the better managerial talent of these powerful managers. With the research done in the field of executive compensation, the knowledge behind the reasoning and structure of the amount of executive compensation is getting clearer and more understood.

2.1.2 Regulations on Executive Compensation

With the growing knowledge on the function and amounts of executive compensations paid, it became clear that this was not optimally functioning. Governments are trying to influence executive compensation through legislation. After the introduction of the compensation disclosure role in 1992, Vafaes & Afxentiou (1998) did their research on the effects of this regulation. They performed multiple regression analyses on the 200 largest non-financial firms. They found that the commissions regarding executive compensation changed in their size and activity. The commissions became smaller and came together more frequently. Additionally, they found that the relation between the CEO pay, and the firm performance became more positive. Correa & Lel (2016) found evidence for adjustments in the amount of executive compensation, after the implementation of say on pay regulations. They performed a panel data regression on 38 companies over the period 2001 to 2012. According to their research, the growth rates of CEO pay declined and their payment is becoming more dependent on the firms' performance. They also show evidence of an increase in firm valuation after the implementation of these regulations. With the introduction of the obligation to report the ratio of the CEO compensation and the average employee's compensation in 2018, it was expected that this ratio would go down. However, based on the research of Chang et al. (2022), this was not the case. They performed multiple OLS regressions using the companies in the Russel 3000 Index for the period 2014-2017. There is no evidence found that the amount of CEO compensation changed with the introduction of the pay ratio disclosure. They do find that a high pay ratio does lead to negative media attention and a higher selling activity by retail investors.

2.1.3 Regulations and the Stock Market

As previously discussed, the regulations did not always have the desired effect of the legislator. The legislation is implemented to construct a fairer executive compensation structure among companies. If the structure is adjusted, this could have consequences on the operating profits of firms and therefore the stock market. Lo (2003) investigated the market's reaction to the SEC regulations implemented in 1992. The sample of 380 companies is split into a group of 190 companies that lobbied against the legislation and a group of 190 companies that did not. The research is done using an event study with an event window of three days (-1,1). He found no abnormal returns following the regulations of 0,43% for the lobbying group and 0,40% for the non-lobbying group. However, those results are not significant. Furthermore, he did find evidence that corporate governance improved in response to the implemented regulations. Larcker et al. (2011) investigated SEC events between the period 2007 and 2009. This includes,

among others, the implementation of legislation but also the hearing of a committee. They used 3.451 individual companies in their research. An event study using an event window of one day (0) is performed where they found significant results for some of the events ranging from -0,24% to 0,7%. However, they did not find a significant abnormal return on average in the stock market resulting from events of the SEC regarding executive compensations. They did find a negative effect regarding the introduction of the SEC regulations and the stock price of companies paying a high compensation in comparison to their peers of -0,28%. Cai & Walkling (2011) did their research on the Say-on-Pay regulation. They compared the return in the event window of three days with the return of a non-event period of three days using portfolios based on firm characteristics. They found a positive reaction of the market on the Say-on-Pay regulation of 1,05%. Companies with weak corporate governance tend to react even more positively to the regulation. Companies that are willing to improve their compensation structure can create higher value due to these regulations. Hitz & Müller-Bloch (2015) looked into the German stock market in reaction to new regulations. They investigated eight regulatory events using an event study using a three-day window (-1,1) in the period 2005 to 2009. Their sample consisted of 203 firms. They found a negative effect on the stock market after the announcement of the two most influential regulations of -2% and -0,6%. They also found a small negative abnormal return on average for all regulations of -0,4%. This effect seemed to be bigger for companies paying a high amount of executive compensation.

Bae et al. (2017) investigated a law restricting CEO payments implemented in 2009 in China. They included 1.212 companies in their research in the period 2005-2015. A Difference-in-Difference test is performed on the sample of the companies that were affected by the legislation and the companies that were not affected. They found that in response to this regulation, the affected companies reduced their amount of CEO compensation by 12,4%. However, next to this, their firm performance dropped by -3,85% relative to the firms not affected by the regulation. They concluded that heavier regulations on CEO compensation could result in negative firm performance. Jiang & Zhang (2018) also did their research on the Chinese market for the period 2007 to 2014. For their research, they used 7.208 firm-year observations. They performed multiple regression analyses using different control variables. The executive compensation policy in China is relatively strict. They found a negative effect of regulations on the firm's performance depending on the legislation of -1561%, -0,9%, and -1,6%. Companies with strong corporate governance experienced fewer negative effects from these regulations. They used an aggregate internal control score and the amount of institutional shareholding as measures for corporate governance.

Bilicka et al. (2022) looked into the reaction of the stock market to anti-tax avoidance regulations. They did their research on 197 multinational companies in the United Kingdom consisting of 1.844 unique subsidiaries for the period 2005-2014. The Difference-in-Difference approach is used to compare companies that are affected by the tax regulations with the companies that are not affected. They found that firms affected by the regulations showed negative abnormal returns of -12.2% for their total assets in comparison to firms that were not affected by the regulation. Access to tax havens is the main driver of this effect. Zheng & He (2022) did their research on the Environmental Protection Law implemented in 2018 in China. The period 2016 to 2019 is investigated for 2.210 companies registered on the Shanghai and Shenzhen Stock Exchange. They performed OLS and probit regressions on this sample. The implemented tax law has a negative effect on the firm performance. They used profitability and development capability as proxies for the firm performance. They found worse results for the companies that were more affected by the regulations.

The research discussed above is shown in a meta table in Table 1.

Table 1 Meta table of the papers

Notes: The table below consists of relevant information on the papers previously discussed. Column 1 shows the paper. Column 2 shows the period investigated in the paper, and column 3 the region of the research. Column 4 shows the used method including the control period and event window used. Column 5 shows the abnormal returns found in the paper.

AUTHOR(S) (YEAR)	PERIOD	REGION	STUDY	ABNORMAL RETURN
Lo (2003)	1992	United States	Event Study Market model Control period: (-206, -5) Event window: (-1,1)	CAR (-1,1): 0,03% (not significant)
Larcker, Ormazabal, & Taylor (2011)	2007-2009	United States	Event Study Market model Event window: (0)	AR (0): -0,24% AR (0): -0,16% AR (0): 0,70%
Cai & Walkling (2011)	2007	United States	Difference-in-Difference	CAR (-1,1): 1,05%
Hitz & Müller-Bloch (2015)	2005-2009	Germany	Event Study Market model Control period: (-250, -6)	MAR (-1,1): -0,4%

			Event window: (-1,1)	
Bae, Gong, & Tong, (2017)	2005-2015	China	Difference-in-Difference	AR: -3,85%
Jiang & Zhang (2018)	2007-2014	China	OLS Regression	-1561% -0,9% -1,6%
Bilicka, Qi, & Xing, (2022)	2005-2014	United Kingdom	Difference-in-Difference	AR: -12,2%
Zheng & He (2022)	2016-2019	China	OLS regression Probit regression	-0,0060 -0,0037

The previous research of Hitz & Müller-Bloch (2015), Jiang & Zhang (2018), and Bae et al. (2017) found small negative abnormal returns following regulations on executive regulations. However, Larcker et al (2011) and Cai & Walkling (2011) also found some small positive abnormal returns in reaction to the regulations. Regulations could potentially create value for a firm if the outcome in equilibrium without the regulation is inefficient. However, another view would be that the current form of compensation is a result of value-maximizing decisions for the shareholders. Legislation constricting this would therefore hurt the shareholders. The legislation considered in this paper is mainly implemented to deal with payment inequality. This would indicate that the legislation does not have the goal of resolving an inefficiency within the firm's performance. The company would not be operating efficiently due to the new legislation. Shareholder's confidence would therefore go down in reaction to the legislation. Based on the previous literature and the discussed theory, the following hypothesis has been formulated.

Hypothesis 1 (H1): The announcement and implementation of the regulations regarding executive compensation results in a negative effect on the firm performance.

In the previous research of Cai & Walkling (2011) and Jiang & Zhang (2018), the quality of corporate governance was used to split their sample. They both found that the companies with strong corporate governance experience fewer effects from the legislation. Strong corporate governance would indicate that shareholders have a bigger voice in the decision-making, and therefore dissatisfaction is already considered. A general measure of corporate governance is the size of the executive board (Hermalin & Weisbach, 2001). A smaller board

would have a more efficient way of working and a more collaborative board, which indicates strong corporate governance. Companies with smaller executive boards would, therefore, experience fewer negative returns than companies with large executive boards. Based on the above, the following hypothesis has been formulated.

Hypothesis 2 (H2)*: The effect of the announcement and implementation of the regulations regarding executive compensation on firm performance is more negative for firms with weak corporate governance.*

The research of Larcker et al. (2011) and Hitz & Müller-Bloch (2015) also focussed on a different reaction of companies paying an abnormally high executive compensation. They found that companies paying excessive executive compensation tend to react more negatively to the legislation. When legislation would not influence a company, there would not be an effect expected on that company's performance. Based on this, companies that are more affected by the legislation would have a bigger reaction to the legislation. Companies paying an abnormally high executive compensation would be considered to be more affected by the legislation and would therefore have a more negative reaction. Based on the literature and theory above, the following hypothesis has been formulated.

Hypothesis 3 (H3)*: The effect of the announcement and implementation of the regulations regarding executive compensation on firm performance is more negative for firms with high executive compensation.*

The research of Bilicka et al. (2022) and Zheng & He (2022) investigated the effects of tax laws. Their findings show negative returns for the companies affected by the new tax laws in comparison to the companies that were not affected. This indicates that companies that must pay a higher tax rate due to new legislation experience negative returns. The SEC legislation considered in this research provides more transparency regarding the level of executive compensation paid. However, this does not have a direct effect on the costs or operations of the firm. The tax legislation would have a direct effect on the tax costs of companies paying abnormal executive compensation. The tax legislation would, therefore, have a bigger impact on the firm and its performance than the SEC regulations. Based on this, the following hypothesis has been formulated.

Hypothesis 4 (H4): The effect of the announcement and implementation of the regulations regarding executive compensation on firm performance is more negative for tax-related regulations in comparison to SEC regulations.

CHAPTER 3 Data

The following chapter will discuss the data used in this research. It will elaborate on the source and the content of the data.

3.1 Source of the Data

The data used consists of three sorts. The first one is a database consisting of financial information of the companies and their executives used in the sample. The second one focuses on the factors used in the determination of the normal return. The last one is the collection of the dates of announcements of the different types of regulations.

3.1.1 Financial Information

This research uses data from the S&P 500 companies. These are the 500 largest companies in the United States of America. The companies are all part of different industries. The daily stock prices are used from these companies for the period 2005 to 2022. This period includes all the announcement and implementation dates of the considered regulations. These stock prices are retrieved from the Center for Research in Security Prices (CRSP). Furthermore, additional company-specific information is retrieved from Compustat. Information regarding the executives and their compensation is retrieved from Compustat ExecuComp. The descriptive statistics of the data are shown in Table 2. The average company in the sample has a board of 6 executives and a stock price of 75 dollars. The average CEO in the sample is a 57-year-old male, owning 0,85% of the company's equity, and receives a compensation of 12.720.000 dollars a year.

To determine the normal return, the Carhart 4-factor model is used. This model uses four different factors, the excess market return, the value factor, the size factor, and the momentum factor. These factors are retrieved from the Kenneth French website for the relevant period.

The descriptive statistics of the variables used in this paper are shown in Table 2. A remark on this is the high standard deviation shown for multiple variables. This can be explained by the fact that these variables consist of a lot of different companies all using a different price scheme for their stock or differences in their reaction to the stock market. Other remarkable notions are that the highest compensation paid is more than thirty times the average compensation paid in the sample. The variable size shows a similar, yet smaller, distribution where the biggest company is almost ten times as big as the average company in the sample. The skewness in these variables makes them not satisfy the assumption of normality. Therefore,

the logarithmic value of those variables is used in the study. The variable Female CEO is a dummy variable that equals one if the CEO is female and zero if the CEO is male. In the sample the vast majority of CEOs are male.

Table 2 Descriptive statistics of the data set

Notes: The following table shows the descriptive statistics of the data used in the research. The variables are shown in column (1) and include the stock price, the return of the stock, the size of the companies, the book-to-market ratio of the enterprise value, the leverage on their operating leverage, the return on assets, the executive compensation paid, the amount of member of their executive board, the age of the CEO, a dummy variable equal to one if the CEO is female and what percentage of equity is owned by the CEO. The mean, median, standard deviation, minimum, maximum, and the number of observations of the variables are shown in columns (2) to (7).

VARIABLE	MEAN	MEDIAN	STD. DEV.	MINIMUM	MAXIMUM	OBS.
STOCKPRICE (DOLLAR)	74,56	48,19	131,25	0,11	3731,41	2.187.933
RETURN (PERCENTAGE)	0,00048	0,00043	0,025	-0,91	2,79	2.187.855
SIZE (IN MILLIONS)	34,8	13,8	85,5	0,0015	297	2.187.933
LOG (SIZE)	16,45	16,44	1,39	7,28	21,81	2.187.933
BOOK TO MARKET RATIO	0,56	0,46	1,75	0,00	361,53	76.937
LEVERAGE	0,65	0,45	0,70	0,00	16,68	82.440
RETURN ON ASSETS	5,84	5,24	8,48	-229,94	57,48	6.810
COMPENSATION CEO (IN MILLIONS)	12,72	10,41	12,7	0	378,00	6.827
LOG (COMPENSATION)	9,22	9,25	0,69	4,61	12,84	6.826
BOARD MEMBERS	5,62	5	1,01	1	14	6.833
AGE OF CEO	56,81	57	6,30	33	92	6.772
FEMALE CEO (DUMMY)	0,04	0	0,20	0	1	6.827
EQUITY OWNED BY CEO (PERCENTAGE)	0,85	0,18	2,69	0	42,93	5.599

3.1.2 Date of Announcement

The dates of the announcement and implantation of the regulations are constructed with the use of different governmental sites. Using the statements uploaded on these sites, a database is constructed of the announcement dates of the Proxy Statement Disclosure, the Pay Ratio Disclose, the Pay-versus-Performance Disclosure, and the Tax Excessive CEO Pay Act. In addition to the date of the announcement, the day of the implementation is also considered. These dates are also retrieved from governmental sites. The regulations entered into force from a specific date. The dates these regulations entered into force are the dates used as the date of implementation. The dates of the announcement and implementation of the regulations are shown in Table 9 in the appendix.

CHAPTER 4 Methodology

The following chapter will discuss the methodology used for this research. To test the research question central to this study, an event study will be performed. First, the event study used will be elaborated, followed by some statistical tests and robustness checks. Additionally, the panel data regression performed will be discussed.

4.1 Event Study

To perform an event study, multiple steps will be executed. The calculations for the abnormal return followed by the normal return will be elaborated in the following paragraph.

4.1.1 Abnormal Return

To account for the effects of multiple regulations regarding executive compensation, an event study will be used. Both the date of the announcement and the date of the implementation will be considered as dates of the event. The event study is computed by Ball & Brown (1968), which has been specified for financial data by MacKinlay (1997). The event study is used to measure the impact of an event on the value of a firm. The stock price will be used to measure the value of the firm. The effect of an event can be seen on a very short time horizon since people tend to react to news quickly (MacKinlay, 1997).

To construct the return of the stocks from their daily prices, corrected for dividends and stock splits, formula (1) is used.

$$(1) \qquad R_{\iota\tau} = \frac{P_{\iota\tau} - P_{\iota\tau-1}}{P_{\iota\tau-1}}$$

In this formula, $R_{\iota\tau}$ is the return of company ι on time τ. The price of the company ι at time τ is reflected by $P_{\iota\tau}$, and $P_{\iota\tau-1}$ accounts for the price of the company ι at time $\tau - 1$.

The event study uses the difference between the realized return and the normal return. The normal return reflects the return realized if the event did not happen. This formula is shown in formula (2).

$$(2) \qquad AR_{\iota\tau} = R_{\iota\tau} - E(R_{\iota\tau}|X_{\tau})$$

In this formula, $AR_{\iota\tau}$ is the abnormal return of company ι on time τ. The normal return of company ι on time τ is $E(R_{\iota\tau}|X_{\tau})$. To construct the normal returns, a different formula is needed. This will be explained in further detail in the next paragraph.

4.1.2 Normal Return

The normal return is the return that would have happened if the event did not occur. To determine the normal return, the Carhart 4-factor model is used. The normal return is calculated over a control period of 120 days. The market model is frequently used in the literature as the model predicting the normal return (MacKlinley, 1997). However, the event of interest is expected to affect the entire market. Therefore, the market model is not considered as a correct model. The Carhart 4-factor model uses multiple factors to predict the normal return, making it more suitable for this research. Carhart (1997) proposed the model as an extension of the Fama and French 3-factor model (Fama & French, 1993). The Carhart 4-factor model is formulated in formula (3).

(3) $$E(R_{\iota\tau}|X_\tau) = \alpha_\iota + \beta_1 EXMKT + \beta_2 HML + \beta_3 SMB + \beta_4 MOM + \varepsilon_{\iota\tau}$$

In this formula $E(R_{\iota\tau}|X_\tau)$, represents the normal return company ι on time τ. The factors for excessive market return, value, size, and momentum are reflected in the variables of the regression. With the normal return of each company, the abnormal return can be calculated using formula (2). Subsequently, the cumulative abnormal returns (CAR) will be determined using formula (4). The estimation window used to determine the abnormal return will be 250 days based on previous similar research (Hitz & Müller-Bloch, 2015).

(4) $$CAR_{(-\tau,\tau)} = \sum_{\tau=-\tau}^{\tau} AR_{\iota\tau}$$

The time window used for formula (4) will be determined based on the previous written literature. The stock market reacts quickly to information, making it possible to use a small window (MacKinlay, 1997). Using a big event window would have higher chances of including reactions on events that are not of interest to the paper. Lo (2003) and Hitz & Müller-Bloch (2015) used an event window of three days around the event day. This would be the day before the event, the day of the event, and the day after. Therefore, this paper will also use a period of three days. The mean of the CAR of each company will be calculated using formula (5) and the variance using formula (6).

(5) $$\overline{CAR}_{t(-\tau,\tau)} = \frac{1}{N}\sum_{\iota=1}^{N} CAR_{\iota(-\tau,\tau)}$$

(6) $$var(\overline{CAR}_{t(-\tau,\tau)}) = \frac{1}{N^2}\sum_{\iota=1}^{N}\sigma^2_{\iota(-\tau,\tau)}$$

In these formulas, N represents the number of companies in the sample used. Furthermore, $CAR_{\iota(-\tau,\tau)}$ is the CAR of company ι, and σ_ι is the variance of company ι. In addition, the mean of the CARs of all companies will be calculated using formula (7). This mean is used as the average CAR in the paper.

(7) $$Average\ \overline{CAR}_{(-\tau,\tau)} = \frac{\sum_{t=1}^{N} CAR_{t(-\tau,\tau)}}{N}$$

4.2 Statistical Test

To test whether the previously discussed average cumulative abnormal returns differ from zero, multiple statistical tests will be performed.

4.2.1 Effect on Firm Performance

To test the first, second and, third hypotheses, a regression will be used. These hypotheses focus on the whole sample, including all companies instead of looking at just one company. A one sample t test is used to account for the significance of the average CARs of the sample. The null hypothesis that the average CAR is equal to zero will be tested. A normal distribution is assumed. Formula (8) is used to calculate the t statistics.

(8) $$t = \frac{average\ \overline{CAR}_{(-\tau,\tau)} - \mu_0}{s/\sqrt{N}}$$

In his formula, the $average\ \overline{CAR}_{(-\tau,\tau)}$ represents the value found in formula (7). The value tested is represented by μ_0, equal to zero. N is equal to the number of observations and s is equal to the standard deviation. The sample is split into different sub-samples to test the different hypotheses.

4.2.2 Group-Specific Effects

The second, third, and fourth hypotheses also test whether there is a difference in the effect of the regulation on the firm performance between the two different groups. These groups will differ in the amount of executive compensation paid, the size of the boards, and the type of regulation. This will be tested using a t-test found by Welch (1947). This t-test tests the null

hypothesis that two groups have an equal mean. This t-test can be used with different sample sizes between the groups. A normal distribution is assumed. Formula (9) is used to calculate the t statistics.

(9)
$$t = \frac{average\ \overline{CAR}_{group1(-\tau,\tau)} - average\ \overline{CAR}_{group2(-\tau,\tau)}}{s^2_{\overline{CAR}_{group1(-\tau,\tau)}} - s^2_{\overline{CAR}_{group2(-\tau,\tau)}}}$$

For the use of this formula, group one and group two will consist of multiple different compositions. At first, group one will be the group of companies paying their highest earning executive below the median and group two will be the group paying above the media. Next, group one will be the group with the size of the board below the median, whereas group two will consist of the companies with the size of the board above the median. Lastly group one will be the reaction to the announcement of the tax regulations and group 2 will be the reaction to the announcements of the SEC regulations. In this case, the companies will be compared with themselves.

In this formula $average\ \overline{CAR}_{group1(-\tau,\tau)}$ will be the average CAR of the companies is group one, where $average\ \overline{CAR}_{group2(-\tau,\tau)}$ will be the average CAR of the companies in group two. Furthermore, $s_{\overline{CAR}_{group1(-\tau,\tau)}}$ is the standard error of the average CAR of group one and $s_{\overline{CAR}_{group2(-\tau,\tau)}}$ is the standard error of the average CAR of group two.

4.3 Robustness Checks

To check the results found for robustness, some additional tests will be performed. The Wilcoxon signed rank test and the Mann-Whitney U test will be discussed in the following paragraph. Additionally, an abnormal return regression will be performed.

4.3.1 Nonparametric statistical tests

The robustness check that will be performed is an additional test for significance. The test used for this is the Wilcoxon signed rank test found by Wilcoxon (1945) and the Mann-Whitney U test found by Mann & Whitney (1947). The test is a nonparametric alternative for other statistical tests. The assumption of a normal distribution is not required, providing a higher degree of robustness. For the Wilcoxon signed rank test, the null hypothesis is that the average CAR of the different companies is equal to zero. The alternative hypothesis is that the average CARs are not equal to zero. Using formula (10) the W-value can be calculated. The z-value will be constructed using formula (11).

(10)
$$W = \sum_{\iota=1}^{N_r}[sgn(x_{2,\iota} - x_{1,\iota}) * R_\iota]$$

(11)
$$z = \frac{W - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}$$

Looking at formula (10), the W stands for the W-value. The sign of the value is shown by sgn, and $x_{2,\iota} - x_{1,\iota}$ is the difference of the observation and the tested value. The tested value will be equal to zero. Every observation is given a rank number shown by R_ι. In formula (11) the z stands for the z-value and n is the number of observations.

The Mann-Whitney U test is used to compare the average CARs between the different groups. The U-values of the two groups are calculated using respectively formula (12) and (13). The z-value is calculated using formula (14).

(12)
$$U_1 = n_1 n_2 + \frac{n_1(n_1+1)}{2} - T_1$$

(13)
$$U_2 = n_1 n_2 + \frac{n_2(n_2+1)}{2} - T_2$$

(14)
$$z = \frac{min(U_1, U_2) - \mu_U}{\sigma_{U_{corr}}}$$

The value of U in both formulas (12) and (13) is calculated using n and T. The number of observations of the different groups are shown by n and the rank sum value is shown by T. Formula (12) will be used for both the group of companies having a small executive board and the group of companies paying a low executive compensation. Formula (13) will calculate the U-value for both the group of companies having a large executive board and the group paying a high executive compensation. Within formula (14), $min(U_1, U_2)$ represents the smallest observation between the calculated U_1 and U_2. The variable μ_U is the expected value of U. The standard error of U is shown by $\sigma_{U_{corr}}$.

4.3.2 Abnormal Return Regression

In addition to the event study, a linear regression with robust standard errors is performed to check the results found in this research. The abnormal return will be explained by the announcement (ann) and implementation (imp) of the discussed regulations. The regression is shown in formula (15).

(15)
$$AR_{\iota,\tau} = \alpha + \beta_1 * ann(Proxy\ Statement\ Disclosure) + \beta_2 *$$
$$imp(Proxy\ Statement\ Disclosure) + \beta_3 *$$
$$ann(Pay\ Ratio\ Disclosure) + \beta_4 * imp(Pay\ Ratio\ Disclosure) + \beta_5 *$$
$$ann(Pay\ versus\ Performance\ Disclosure) + \beta_6 *$$
$$imp(Pay\ versus\ Performance\ Disclosure) + \beta_7 *$$
$$ann(Tax\ Excessive\ CEO\ Pay\ Act) + \varepsilon$$

This regression shows the explanatory power of the announcement and implementation of the legislations on the abnormal return. Dummy variables will be used with a value of one after the announcement as well as the implementation of the legislation.

4.4 Additional Effects

In addition to the research question, some other effects of the regulations will be investigated. The effect of the regulations on the level of executive compensation paid in the following fiscal year will be discussed.

4.4.1 Hausmann Test

Before performing the panel data regression, it is important to determine whether to use fixed effects or random effects (Hausman, 1978). The Hausman test will be performed to check for correlation between the characteristics and the regressors. The null hypothesis tested with this test is that there is no correlation between the characteristics and the regressors and that random effects should be used. The Hausman test is shown in formula (16).

(16)
$$H = (\beta_1 - \beta_0)^T [var(\beta_0) - var(\beta_1)]^\dagger (\beta_1 - \beta_0)$$

Within this formula, the β_0 refers to the fixed effects estimator, and β_1 to the random effects estimator. The Moore-Penrose pseudo inverse is represented by the † (Moore, 1920 and Penrose, 1955).

4.4.2 Level of Executive Compensation

To examine the effects of the regulations on the level of executive compensation paid a panel data regression with clustered standard errors will be performed. For this regression, multiple control variables are used. Formula (17) shows the regression.

(17)
$$Log(Compensation)_{it} = \alpha + \beta_1 * Proxy\ Statement\ Disclosure_{it} + \beta_2 * \\ Pay\ Ratio\ Disclosure_{it}\gamma * Firm\ Performance_{it-1} + \delta * \\ Firm\ Controls_{it-1} + \theta * CEO\ Controls_{it} + \varepsilon_{it}$$

With this regression, the effect of the implementation of the regulations on the level of executive compensation paid is considered. The dependent variable is the logarithmic value of the compensation of the CEO for company i at time t. The variables *Proxy Statement Disclosure* and *Pay Ratio Disclosure* and represent dummy variables. The value of the variables will be equal to one in the years following the implementation. The companies are obligated to comply with this legislation in those years. The value will be zero in the other years. Since the Pay-versus-Performance Disclosure is implemented at the end of 2022, and the data for 2023 is not yet available, this regulation cannot be taken into account. For *Firm Performance*, the return of the company is considered. As control variables, the firm and CEO-specific information discussed in Table 2 is considered. The *Firm Controls* used include the size of the firm, the book-to-market ratio, the leverage on their operations, the return on assets, and the compensation paid in the previous year. The *CEO Controls* used in the regression are the age and gender of the CEO and the amount of equity which is owned by the CEO.

CHAPTER 5 Results

The following chapter will discuss the results of this research. At first, the results focussing on the effect of the regulations on the firm performance will be discussed. This will be followed by some additional effects of the regulation.

5.1 Firm Performance

The following paragraph will focus on the reaction of the firm performance on the implemented regulations. First, the results from the entire sample will be discussed. Next, the sample will be split based on the quality of governance, whether they paid a relatively high or low level of executive compensation, and the type of regulation.

5.1.1 General Results

At first, the results of the entire sample will be discussed. This aims to answer the first hypothesis. The first hypothesis is stated as follows:

H1: The announcement and implementation of the regulations regarding executive compensation results in a negative effect on the firm performance.

To test this hypothesis, it should be determined whether the average cumulative abnormal return (CAR) of the regulations differs from zero. To test this a significance test is performed. The results of this are shown in table 3.

Table 3 The average cumulative abnormal returns of the regulations for an event window of (-1,1)
Notes: The following table shows the average cumulative abnormal returns for the different regulations split into their announcement and their implementation. Column (1) shows the type of regulations, column (2) whether it is the announcement or implementation, and column (3) shows the date of the announcement or implementation of the corresponding regulation. Column (4) shows the average cumulative abnormal return. The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

REGULATION	ANNOUNCEMENT/ IMPLEMENTATION	DATE	AVERAGE CAR (-1,1)
Proxy Statement Disclosure	Announcement	26-07-2006	0,000
Proxy Statement Disclosure	Implementation	22-12-2006	-0,002***

Pay Ratio Disclosure	Announcement	05-08-2015	0,002*
Pay Ratio Disclosure	Implementation	01-01-2017	0,003**
Pay-Versus-Performance Disclosure	Announcement	25-08-2022	-0,003
Pay-Versus-Performance Disclosure	Implementation	16-12-2022	-0,006***
Tax Excessive CEO Pay Act	Announcement	17-03-2021	0,000
All regulations	Announcement	-	0,000
All regulations	Implementation	-	-0,002**
All regulations	Both	-	-0,001

The table above shows multiple significant results for the average CAR of the different regulations. The implementation of the Proxy Statement Disclosure, Pay Ratio Disclosure, and the Pay-versus-Performance Disclosure as well as the announcement of the Pay Ratio Disclosure show significant results. These results however are very close to zero. Both the implementations of the Proxy Statement Disclosure and the Pay-versus-Performance Disclosure show a small negative average CAR at the 1% significance level of respectively -0,2% and -0,6%. The Pay Ratio Disclosure shows a very small positive return for both the announcement and the implementation of respectively 0,2% and 0,3%. Looking at the regulations as a group, the implementation seems to have a bigger effect than the announcement. The implementation of the regulations led to a decrease in the profitability of the company by -0,2%. Contrary to the implementation, the announcement of the regulations did not have a significant effect on the return of the companies.

The results from the table above show that the implementation of regulations regarding executive compensation results in a small negative effect on the firm's performance. The announcement of these regulations does not seem to influence the firm's performance in the sample.

5.1.2 Quality of Corporate Governance

The second hypothesis focuses on a difference in effect based on the quality of corporate governance. To account for the quality of corporate governance, the size of the executive board is used as a measure of strong corporate governance. The size of the executive board is a measure of the quality of corporate governance used in previous literature (Jiang & Zhang,

2018). A smaller board would be more efficient and collaborative and therefore stronger. The second hypothesis is stated as follows:

***H2**: The effect of the announcement and implementation of the regulations regarding executive compensation on firm performance is more negative for firms with weak corporate governance.*

To test this hypothesis the size of the executive board of the company is taken into account. The size of the board is defined as the number of executives that are active on the board. The entire sample is split into two sub-samples. The first sub-sample consists of companies with a board that has fewer executives than the median. The second sub-sample consists of the companies with a larger board than the median. A one sample t-test is performed to account for significance. The significance of the difference is determined using the t-test of Welch (1947). The results of sub-sample one and sub-sample two are shown in Table 4.

Table 4 The average cumulative abnormal returns of the companies split according to the size of the executive board for an event window of (-1,1)

Notes: The following table shows the average cumulative abnormal returns for the companies having a small executive board. The different regulations are split into their announcement and their implementation. Column (1) shows the type of regulations, column (2) whether it is the announcement or implementation, and column (3) shows the date of the announcement or implementation of the corresponding regulation. Column (4) shows the average cumulative abnormal return for the companies having a smaller executive board than the median and column (5) shows the average cumulative abnormal return for the companies having a larger executive board than the median. Column (6) shows the difference by subtracting column (4) from column (5). The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

REGULATION	ANNOUNCEMENT/ IMPLEMENTATION	DATE	AVERAGE CAR (-1,1) SMALL BOARD	AVERAGE CAR (-1,1) LARGE BOARD	DIFFERENCE (4) AND (5)
Proxy Statement Disclosure	Announcement	26-07-2006	0,001	-0,001	-0,002
Proxy Statement Disclosure	Implementation	22-12-2006	-0,002**	-0,003	-0,001
Pay Ratio Disclosure	Announcement	05-08-2015	-0,001	0,004**	0,005*

Pay Ratio Disclosure	Implementation	01-01-2017	0,004**	0,002	-0,002
Pay-Versus-Performance Disclosure	Announcement	25-08-2022	-0,003	-0,003*	0,000
Pay-Versus-Performance Disclosure	Implementation	16-12-2022	-0,006***	-0,006***	0,000
Tax Excessive CEO Pay Act	Announcement	17-03-2021	0,002	-0,001	-0,003
All regulations	Announcement	-	0,000	0,000	0,000
All regulations	Implementation	-	-0,001	-0,002**	-0,001
All regulations	Both	-	-0,001	-0,001	0,000

The tables above show the average CARs of the companies split by the size of their executive board. The results shown in both tables are all very close to zero, implying that the effect is very small. Looking at the first sample, showing the companies having a relatively small board of executives, only the announcement of the Pay Ratio Disclosure and both the announcement and the implementation of the Pay-Versus-Performance Disclosure show a significant result. The announcement of the Pay Ratio Disclosure was followed by a positive average CAR of 0,4% whereas the announcement and implementation of the Pay-Versus-Performance Disclosure show a negative average CAR of respectively -0,3% and -0,6%. The implementation of all the regulations shows a negative return for the third sub-sample of -0,2%. Column 4 shows significant results for the implementation of all the SEC regulations. The implementation Pay Ratio Disclosure shows a positive average CAR of 0,4%, while the implementation of the Proxy Statement Disclosure and the Pay-Versus-Performance Disclosure show a negative average CAR of respectively -0,2% and -0,6%.

Comparing the results from the two sub-samples, it seems that there is no real difference between them. Overall, the results show a lot of resemblance. Also, looking at the implementation of the Pay-Versus-Performance Disclosure, the return for both groups following this regulation is the same. Similar to the previous results, the implementation of the regulations seems to have a bigger effect than their announcement. The effect of the implementation on the first sub-sample is less negative than the effect on the second sub-sample and shows significance. This implies that companies having a larger executive board experience more negative returns due to the implementation of the regulations than their peers having a

bigger board. However, the difference between the two shows no significance. Looking at the only significant result in column (5), it shows that the large board experiences more positive returns than the small board. This would contradict the hypothesis and would imply that a weaker board of executives experiences more positive returns followed by the regulations. However, this is only the case for the announcement of the Pay Ratio Disclosure and has therefore not that much concluding power.

5.1.3 Level of Executive Compensation

The third hypothesis focuses on the difference in reaction to the regulations between companies based on the level of executive compensation paid. The third hypothesis is stated as follows:

***H3**: The effect of the announcement and implementation of the regulations regarding executive compensation on firm performance is more negative for firms with high executive compensation.*

To test this hypothesis, the amount paid to their highest-earning executive is considered. The sample is split into two sub-samples based on this. The third sub-sample consists of the companies paying their highest-paid executive below the median of the entire group. The fourth sub-sample are the companies paying their executive above the median of the entire group. A one sample t-test is performed to account for significance. The significance of the difference is determined using the t-test of Welch (1947). The results of sub-samples one and two are shown in Table 5.

Table 5 The average cumulative abnormal returns of the companies split according to their level of executive compensation (EC) for an event window of (-1,1)
Notes: The following table shows the average cumulative abnormal returns for the companies paying low executive compensation. The different regulations are split into their announcement and their implementation. Column (1) shows the type of regulations, column (2) whether it is the announcement or implementation, and column (3) shows the date of the announcement or implementation of the corresponding regulation. Column (4) shows the average cumulative abnormal return for the companies paying their highest-earning executive below the median, and column (5) shows the average cumulative abnormal return for the companies paying their highest-earning executive above the median. Column (6) shows the difference by subtracting column (4) from column (5). The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

REGULATION	ANNOUNCEMENT/ IMPLEMENTATION	DATE	AVERAGE CAR (-1,1) LOW EC	AVERAGE CAR (-1,1) HIGH EC	DIFFERENCE (4) AND (5)
Proxy Statement Disclosure	Announcement	26-07-2006	-0,003**	0,004**	0,007***
Proxy Statement Disclosure	Implementation	22-12-2006	-0,001	-0,003*	-0,002
Pay Ratio Disclosure	Announcement	05-08-2015	0,003	0,002	-0,001
Pay Ratio Disclosure	Implementation	01-01-2017	0,001	0,005***	0,004*
Pay-Versus-Performance Disclosure	Announcement	25-08-2022	-0,002	-0,004	-0,002
Pay-Versus-Performance Disclosure	Implementation	16-12-2022	-0,003*	-0,009***	-0,006***
Tax excessive CEO pay act	Announcement	17-03-2021	0,004	-0,004	-0,008**
All regulations	Announcement	-	0,000	0,000	0,000
All regulations	Implementation	-	-0,001	-0,002*	-0,001
All regulations	Both	-	0,000	-0,001	-0,001

The tables displayed above show the average CARs for the sample split based on the level of executive compensation they paid. Multiple of these results show significance. Remarkably, the results are still very close to zero, implying that the effect is small. Looking at the third sub-sample, there is a small negative average CAR of 0,3% following the announcement of the Proxy Statement Disclosure and the implementation of the Pay-Versus-Performance Disclosure. For the regulations considered together, there are no significant results. Looking at the fourth subsample all the implementations of the SEC regulations show significance. For both the Proxy Statement Disclosure and the Pay-Versus-Performance Disclosure this effect is negative and respectively -0,3% and -0,9%. The implementation of the Pay Ratio Disclosure, however, shows a positive average CAR of 0,5%, as well as the announcement of the Proxy Statement Disclosure. The implementation of all regulations measured as a whole, led to a negative effect of -0,2%.

Comparing these two tables, it seems that the companies paying a lower executive compensation perform better in reaction to the regulations than the companies paying a higher executive compensation. However, looking at the results of the announcement of the Proxy Statement Disclosure and the implementation of the Pay-Versus-Performance Disclosure, it seems to be the other way around. For the Pay-versus Performance Disclosure, both the third and the fourth sub-sample show a negative reaction, however, the reaction is 0,06 percent point less negative for the companies paying a higher compensation. Looking at the regulations as a whole, it seems that the implementation of the regulations seems to have a bigger effect than the announcement of the regulations for both sub-samples. However, the negative effect of the implementation is bigger, and significant for the fourth sub-sample. This would indicate that the companies paying a low executive compensation experience better returns due to the implemented regulation than companies paying a high executive compensation. However, the difference between those two does not show significance. Since the difference between the two subsamples shows positive and negative significant returns, it can be concluded that the subsamples react differently, however, it is dependent on the regulation which way. Looking at the Tax Excessive CEO Pay Act, it makes sense that the companies paying higher compensation experience more negative returns since those are the companies that will be affected the most by that act. However, the difference in reaction between the SEC regulations cannot be easily explained.

5.1.4 SEC versus Tax Regulation

The regulations previously discussed can be divided into two groups based on their type of regulation. The first group would consist of the SEC regulations and the second group of the tax regulation. The fourth hypothesis is stated as follows:

H4: *The effect of the announcement and implementation of the regulations regarding executive compensation on firm performance is more negative for tax-related regulations in comparison to SEC regulations.*

To test this hypothesis the average CAR of the announcements of the SEC regulations will be compared to the announcement of the tax regulation. Only the announcements of the SEC regulations will be considered to account for the difference between the reaction to the announcement and the implementation of a regulation. Since the Tax Excessive CEO Pay Act is not yet implemented, the implementation dates will be left out for the SEC regulations as

well. Furthermore, the sample will be split into the four subsamples previously discussed to account for differences between them. The results are shown in table 6.

Table 6 The difference between the SEC regulations and the tax regulation

Notes: The following table shows the average CAR of the announcements of all SEC regulations and the tax regulation and the difference between those. Column (1) shows from which sample the results are, this could be the entire sample, the subsamples based on their quality of corporate governance, or the subsamples based on the level of executive compensation paid. Column (2) shows the average CAR of the SEC regulations and column (3) the average CAR of the tax regulation. The difference between the two is shown in column (4). The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

SAMPLE	AVERAGE CAR (-1,1) SEC REGULATION	AVERAGE CAR (-1,1) TAX REGULATION	DIFFERENCE (1) AND (2)
Entire sample	0,000	0,000	0,000
High compensation	0,000	-0,004	-0.004
Low compensation	0,000	0,004	0.004
Big board	0,000	-0,001	-0.001
Small board	0,000	0,002	0.002

The table above shows no significant results. The average CAR of the SEC regulations is equal to zero for all the samples. The average CAR of the tax regulations shows some positive and negative results, however, none of them is significant. The difference between the two is also not significant. It can be concluded that there is no difference between the effect of the announcement of SEC regulation and the announcement of tax regulations on the firm's performance. Since the implementation of the two is not considered, this cannot be concluded for the implementation.

5.2 Robustness Checks

In addition to the previously discussed results, some robustness checks are performed. These tests are performed to account for the robustness of the results found. The significance of the results is checked with the Wilcoxon signed rank test and the Mann-Whitney U test. Additionally, the results are checked with a regression analyses.

5.2.1 Nonparametric significance tests

The Wilcoxon signed rank test and the Mann-Whitney U test are both alternative tests for significance. In the previous paragraphs, the significance is tested using a t-test. With the inclusion of a nonparametric test, not assuming a normal distribution, the degree of robustness of the results is increased. The results of the nonparametric significance tests are shown in Tables 10, 11, and 12 in the appendix. The results found with the nonparametric significance tests show many resemblances with the results of the one sample t-test. For the entire sample, it can be concluded that the implementation of the different regulations results in a negative return for the companies. However, the Pay Ratio Disclosure shows significant positive returns for both the announcement and the implementation. The sub-sample consisting of the companies with a small executive board shows many significant negative returns in reaction to the announcement and implementation of the legislation. However, in comparison to the sub-sample consisting of companies with a large executive board, there are few significant results. Table 12 shows the results for the sub-samples split according to their level of executive compensation. More significant results are found in comparison to the t-test. Looking at the difference between the two sub-sample there are some significant positive and negative results. This would imply that the two groups do react differently, however, it is still unclear which way. This could be dependent on the type of regulation. The same was concluded with the results of the t-test. It can be concluded that the results found are robust in their significance.

5.2.2 Abnormal Return Regression

Additionally, a regression analysis is performed to check the results found with the event study. The effect of the announcement and implementation of the different regulations on the abnormal return is analysed using these regressions. The results of the regression are shown in table 13 in the appendix. The regression shows some significant negative results for both the announcement and implementation of the Pay versus Performance Disclosure and the announcement of the Proxy Statement Disclosure. A significant positive result is found for the announcement of the Pay Ratio Disclosure. This would imply that the Pay versus Performance Disclosure and the announcement of the Proxy Statement Disclosure are associated with a negative effect on the abnormal return. The announcement of the Pay Ratio Disclosure, however, seems to have a positive effect on the abnormal return. The results found with the regression are in line with the results previously discussed.

5.3 Additional Effects

In addition to the previously discussed results, some other tests are performed to account for the effects of the implemented regulations. The effect of the regulations on the amount of executive compensation paid will be discussed in the following paragraph.

5.3.1 Hausman Test

The Hausman test is performed to test whether the panel data regression should be performed using fixed effects or random effects. The Hausman test is performed on the regression including all the dependent variables. This test tests the null hypothesis that there is no correlation between the characteristics and the regressors. If the null hypothesis can be rejected, fixed effects should be used. When the null hypothesis cannot be rejected, random effects should be used in the regression. The results of the Hausman test are shown in table 7.

Table 7 Hausman test

Notes: The following table shows the results of the Hausman test. Column (1) shows the variables and column (2) shows the value of the respective variable.

HAUSMAN TEST

CHI2	721,34
P-VALUE	0,000

The table above shows the results of the Hausman test. The p-value is 0.000, meaning the null hypothesis can be rejected. The panel data regression will therefore be performed using fixed effects.

5.3.2 Effect on Level of Compensation

The regulations discussed in this paper are all implemented with the motive to diminish the extreme executive compensations paid. The SEC regulation primarily aims to achieve this by making the amount more transparent and public, while the tax regulation aims to provide a financial incentive. However, it has not been researched thoroughly if these regulations did affect the amount of executive compensation paid. The effect of the regulations on the compensation in the years after the implementation is considered for this regression since that would be the first year that the company should comply with that regulation. For multiple of the control variables, the lagged variable is used. The compensation paid in the current year should be based on the firm-specific information of the year before. Four regressions are performed with different control variables added. The first regression only has the implemented

regulations, for the second regression only the CEO-specific control variables are added, and for the third regression only the firm-specific control variables are added. The fourth regression includes all control variables. The coefficients resulting from the regressions performed are shown in Table 8.

Table 8 Panel data regression on the level of CEO compensation

Notes: The following table shows the coefficients of multiple regressions on the level of executive compensation paid. Column (1) shows the variables in the regression. Column (2) shows the coefficients of first regression performed, column (3) the coefficients of the second regression, column (4) the coefficients of the third regression, and column (5) the coefficients of the fourth regression. The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

VARIABLE	(1)	(2)	(3)	(4)
PROXY STATEMENT DISCLOSURE	0,159***	0,098***	0,027	0,017
PAY RATIO DISCLOSURE	0,288***	0,269***	0,115***	0,113***
L.RETURN			26,450**	28,739***
L.LOG(SIZE)			0,198***	0,189***
L.RETURN ON ASSETS			-0,003	-0,004**
L.LEVERAGE			-0,096**	-0,090*
L.BOOK TO MARKET RATIO			0,033***	0,030***
L.LOG(COMPENSATION)			0,182***	0,171***
FEMALE		-0,138**		-0,226***
AGE		0,014***		0,011***
EQUITY OWNED		0,000***		0,000***
CONSTANT	9,048***	8,400***	4,285***	3.894***
OBSERVATIONS	3.401	3.340	2.951	2.929
R SQUARED	0,05	0,10	0,46	0,47

The table above shows the coefficients of multiple variables in different panel data regressions. Looking at the first regression, both the Proxy Statement Disclosure and the Pay Ratio Disclosure have a positive coefficient of respectively 0,159 and 0,288. The implementation of the Proxy Statement Disclosure is therefore linked with an increase in the logarithmic value of the executive compensation of 0,159. The Pay Ratio Disclosure is linked with a 0,288 increase in the logarithmic value of executive compensation. This would indicate

that the executive compensation paid is increased due to the implementation of regulations regarding executive compensation. However, the R squared of this regression is very low, indicating that the model is weak and needs expansion.

The second regression is expanded with the CEO-specific control variables. Looking at the coefficients from the Proxy Statement Disclosure and the Pay Ration Disclosure, there is still a positive relation between those, and the logarithmic value of the executive compensation paid in the year after implementation of respectively 0,098 and 0,269. For the control variables, the coefficients also show significance. If the gender of the executive is female, the compensation is significantly lower than her male colleagues. The age of the executive has a positive coefficient, indicating that the older an executive is, the higher their compensation. The R squared of the second regression is doubled relative to the first regression, however, it is still low. The model does not have enough explanatory power to form conclusions.

The third regression includes the firm-specific control variables. The significance of the Proxy Statement Disclosure is diminished due to the addition of the control variables. The coefficient of the Pay Ratio Disclosure, however, is still significant. The implementation of the Pay Ratio Disclosure led to an increase in the logarithmic value of the executive compensation of 0,115. Other positive coefficients in this regression are the return of the company in the previous year, the size of the company in the previous year, the book-to-market ratio of the previous year, and the compensation paid in the previous year. The return of the company shows a remarkably high coefficient indicating that the return of the company in the previous year has a large effect on the amount of compensation paid. The leverage of the company in the previous year shows a negative coefficient. The R squared of the model including the firm-specific control variables is rapidly increased to 0,46. This indicated that the model is stronger and has some explanatory power, however, there is still room for improvement.

The fourth regression includes all control variables previously discussed. The coefficient of the Proxy Statement Disclosure is not significant in this model. The Pay Ratio Disclosure shows a positive coefficient of 0,113. This means that the implementation of the Pay Ratio Disclosure led to an increase in the logarithmic value of the executive compensation of 0,113. The control variables also show significant results. The signs of the coefficients of the control variables are all the same in comparison to their coefficients in the previously discussed regressions. The return of the firm in the previous year even increased concerning the third regression, making the influence of the return of the company in the previous year on the executive compensation paid even more important. The coefficient of the female gender of the executive is also even more negative. This indicated that the female executives earn

significantly lower executive compensation than their male colleagues. The R squared of the fourth regression is equal to 0,47, which is a small increase in comparison to the R squared of the third regression. The model is moderately strong and has some explanatory power. However, there is still a significant part of the amount of executive compensation that is not explained by the model.

The main takeaway of the regressions discussed is that the implemented regulations did not have a diminishing effect on the executive compensation paid in the next year. They even have a significantly positive effect. The executive compensation paid is increased due to the implementation of the regulations. This effect is the opposite of what was expected and intended by the legislator.

CHAPTER 6 Discussion

The following chapter will discuss the limitations of the paper and compare the results found with previous results. Lastly, some suggestions regarding potential future research will be made.

6.1 Theoretical Insights

The following paragraphs will discuss the limitations of the results found in the paper. Furthermore, a comparison with the existing literature will be made.

6.1.1 Methodological Considerations and Study Limitations

The method used in this paper is the event study. The event study is a well-known method to analyse the abnormal returns of a stock due to an event (MacKinley, 1997). Event studies are mostly used for mergers and acquisitions but can be used in a wide range of events. This paper used the event study to account for a change in a firm's performance. The stock price is used as a measure of firm performance. An assumption for this is that the stock price reflects all relevant information about the company. However, this might not always be the case. Assumptions made on market efficiency may be challenged in certain situations with information asymmetry or with high market sentiment. This would lead to an unfair stock price and therefore a misleading value of firm performance. Furthermore, this study used a three-day event window to account for the short-term results of the regulations. However, there may be also long-term effects that are not captured with this event window. To account for the long-term impact of the regulations a larger window should be used.

Another limitation of the study focuses on the sample used. The sample focussed on in this paper are the companies included in the S&P500. These companies are the largest companies in the United States and therefore only represent a small sample of all companies in the world. The findings of the paper might, therefore, not be the same for smaller firms or different markets. The effects of the regulations might vary between different countries, firm sizes, or industries and sectors. Furthermore, the study examines the quality of corporate governance by only looking at the size of the corporate board. This does not fully capture the quality of the corporate governance of the company. Additionally, different viewpoints exist regarding the influence of the size of the board on the quality of corporate governance. A big board equals less efficiency, but also more knowledge and diverse visions. Other measures of corporate governance should be investigated to fully account for the effects of the quality of corporate governance.

The research does not account for interaction effects between the regulations. The SEC regulations and Tax Excessive CEO Pay Act are all announced and implemented in a relatively short time horizon. Therefore, their effects could be influenced by each other. Furthermore, there could have been other regulations announced, not included in this paper, that influenced the reaction to the discussed regulations. Lastly, the Tax Excessive CEO Pay Act considered in this paper, is not yet implemented. Therefore, the reaction of the firms regarding tax regulations could be different for the implementation of the act than what is considered in this paper. The lack of a difference found in the paper between the SEC regulations and the tax regulations does not mean that there is no difference between the two for the implementation. The effects of tax laws on firm performance should be studied after the implementation of the Tax Excessive CEO Pay Act.

6.1.2 Relation to Existing Literature

The previous literature regarding the market's reaction to legislation on executive compensation did not provide a concise answer. The finding that the implementation of the regulations on average leads to a small negative abnormal return is in line with the findings of Hitz & Müller-Bloch (2015), Jiang & Zhang (2018), and Bae et al. (2017). However, the Pay Ratio Disclosure was followed by some small positive abnormal returns, which are more in line with the findings of Larcker et al. (2011) and Cai & Walkling (2022). The different regulations seem to have different influences on the firm performance. This might be due to the fact that the regulations all have a different influence on the firm. However, the SEC regulations do show a resemblance in their function and effect on a firm.

Furthermore, there is no real difference found between the reaction of companies having strong corporate governance and the companies having weak corporate governance. This contradicts the findings of Jiang & Zhang (2018) and Cai & Walkling (2022) which both found that firms with strong corporate governance react less negatively to the legislation.

However, there seems to be a different reaction to the regulations for companies paying high executive compensation relative to the companies paying low executive compensation. However, there is some inconsistency in which way they react. The results of Larcker et al (2011) and Hitz & Müller-Bloch (2015) show a more negative reaction for firms paying high executive compensation. For the Pay-versus-Performance Disclosure and the Tax Excessive CEO Pay Act, similar results are found. However, the Proxy Statement Disclosure and the Pay Ratio Disclosure show opposite results. This could potentially be explained by the fact that the Pay-versus-Performance Disclosure and the Tax Excessive CEO Pay Act led to more negative

effects for high-paying firms than the other regulations. The influence of the Proxy Statement Disclosure and Pay Ratio Disclosure on companies is potentially smaller due to the fact that those disclosures could provide a way to explain and approve their high payment. Whereas the Pay-versus-Performance Disclosure is less susceptible by presentation and more focussed on facts, like the Tax Excessive CEO Pay Act.

Lastly, the findings of Bilicka et al. (2022) and Zheng & He (2022) show negative returns for companies affected by tax legislation. The findings of this paper do not confirm those results. The announcement of the tax law does not show significant abnormal returns. Furthermore, there is no difference shown in the reaction to the announcement of SEC regulations and the tax regulation. This difference is also not found when controlling for the level of executive compensation and the quality of corporate governance.

6.2 Suggestions for Future Research

The following paragraph will discuss some of the suggestions for future research in the field of the effect of regulations on the firm's performance.

6.2.1 Future Research Directions

The research done in the field of executive compensation is very broad and inclusive. However, there are still some uncertainties that could be further researched. Looking at the effect of regulations on executive compensation on the firm performance, a broader time window could be investigated to account for the long-term effects of the regulations. Furthermore, different markets and differences between industries could be investigated. Different markets and industries could react differently to the regulations than researched in this paper. To fully analyse the effects of the Tax Excessive CEO Pay Act, this should also be included in research after the implementation of the act. Lastly, the effects of the Pay-versus-Performance Disclosure and the Tax Excessive CEO Pay Act on the amount of executive compensation paid could be investigated in later research.

CHAPTER 7 Conclusion

The following chapter will summarize the key findings of the paper and give an answer to the different hypotheses. Furthermore, the practical implications of the paper will be discussed.

7.1 Key Findings

The following paragraphs will give an overview of the key findings of the paper and provide an answer to the research question by potentially accepting the hypotheses.

7.1.1 Research Question and Hypotheses

This research focussed on the effects of multiple regulations on executive compensation on the firm performance of companies in the S&P500. The research question stated as follows:

To what extent did the regulations regarding executive compensation have an effect on the firm performance of companies in the United States?

To answer this research question, multiple hypotheses were formulated. The first hypothesis proposed that the announcement and implementation of regulations regarding executive compensation have a negative effect on the firm performance. The findings of this paper show a small negative average CAR for the implementation of all the regulations combined of -0,2%. The announcement of the regulations does not show significant results for the regulations combined. Therefore, this hypothesis is partially accepted. The implementation of regulations regarding executive compensation has a negative effect on the firm performance.

The second hypothesis proposed that firms with weak corporate governance experience more negative returns due to the regulations. However, the findings of this paper do not show real differences between firms with strong corporate governance and firms with weak corporate governance. The second hypothesis cannot be accepted.

The third hypothesis stated that firms paying a high executive compensation experience more negative returns due to the regulations. The findings of this paper show some contrasting results. Some of the results found support the hypotheses with a significant difference in their average CAR of -0,8% and -0,6%. However, some results do not support this hypothesis with a difference between their average CAR of 0,7% and 0,4%. In all likelihood based on these contrasting results, there are no significant results found for the regulations considered together. The hypothesis can be partially accepted. Firms paying a high executive compensation

experience different returns due to the regulations than the firms paying a low executive compensation.

The fourth hypothesis proposed that the firm performance is more negatively affected by tax regulations than SEC regulations. However, the findings of the paper show no significant difference between the two types of regulation. The fourth hypothesis cannot be accepted.

Additionally, the effect of the regulations on the amount of executive compensation paid in the following year is analysed. The findings show that the amount of executive compensation paid is increased due to the implementation of the legislation regarding executive compensation for the Pay Ratio Disclosure. Furthermore, it shows that the amount of compensation is mainly influenced by the return made in the previous year and that female CEOs receive a lower compensation than their male colleagues.

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APPENDIX

Table 9 Dates of announcements and implementations of regulations

Notes: The following table shows the event date for the multiple regulations. The different regulations are split into their announcement and their implementation. Column (1) shows the type of regulations, column (2) whether it is the announcement or implementation, and column (3) shows the date this regulation was announced or implemented.

REGULATION	ANNOUNCEMENT/ IMPLEMENTATION	DATE
PROXY STATEMENT DISCLOSURE	Announcement	26-07-2006
PROXY STATEMENT DISCLOSURE	Implementation	22-12-2006
PAY RATIO DISCLOSURE	Announcement	05-08-2015
PAY RATIO DISCLOSURE	Implementation	01-01-2017
PAY-VERSUS-PERFORMANCE DISCLOSURE	Announcement	25-08-2022
PAY-VERSUS-PERFORMANCE DISCLOSURE	Implementation	16-12-2022
TAX EXCESSIVE CEO PAY ACT	Announcement	17-03-2021

Table 10 The average cumulative abnormal returns of the regulations for an event window of (-1,1) using nonparametric tests for significance

Notes: The following table shows the average cumulative abnormal returns for the different regulations split into their announcement and their implementation. Column (1) shows the type of regulations, column (2) whether it is the announcement or implementation, and column (3) shows the date of the announcement or implementation of the corresponding regulation. Column (4) shows the average cumulative abnormal return. The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

REGULATION	ANNOUNCEMENT/ IMPLEMENTATION	DATE	AVERAGE CAR (-1,1)

Proxy Statement Disclosure	Announcement	26-07-2006	0,000
Proxy Statement Disclosure	Implementation	22-12-2006	-0,002***
Pay Ratio Disclosure	Announcement	05-08-2015	0,002***
Pay Ratio Disclosure	Implementation	01-01-2017	0,003*
Pay-Versus-Performance Disclosure	Announcement	25-08-2022	-0,003*
Pay-Versus-Performance Disclosure	Implementation	16-12-2022	-0,006***
Tax Excessive CEO Pay Act	Announcement	17-03-2021	0,000
All regulations	Announcement	-	0,000
All regulations	Implementation	-	-0,002***
All regulations	Both	-	-0,001

Table 11 The average cumulative abnormal returns of the companies split according to their number of executives on the executive board for an event window of (-1,1) using nonparametric tests for significance

Notes: The following table shows the average cumulative abnormal returns for the companies having a small executive board. The different regulations are split into their announcement and their implementation. Column (1) shows the type of regulations, column (2) whether it is the announcement or implementation, and column (3) shows the date of the announcement or implementation of the corresponding regulation. Column (4) shows the average cumulative abnormal return for the companies having a smaller executive board than the median and column (5) shows the average cumulative abnormal return for the companies having a larger executive board than the median. Column (6) shows the difference by subtracting column (4) from column (5). The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

REGULATION	ANNOUNCEMENT/ IMPLEMENTATION	DATE	AVERAGE CAR (-1,1) SMALL BOARD	AVERAGE CAR (-1,1) LARGE BOARD	DIFFERENCE (4) AND (5)
Proxy Statement Disclosure	Announcement	26-07-2006	0,001	-0,001	-0,002
Proxy Statement Disclosure	Implementation	22-12-2006	-0,002***	-0,003	-0,001

Pay Ratio Disclosure	Announcement	05-08-2015	-0,001***	0,004**	0,005
Pay Ratio Disclosure	Implementation	01-01-2017	0,004	0,002**	-0,002
Pay-Versus-Performance Disclosure	Announcement	25-08-2022	-0,003**	-0,003	0,000
Pay-Versus-Performance Disclosure	Implementation	16-12-2022	-0,006***	-0,006***	0,000
Tax Excessive CEO Pay Act	Announcement	17-03-2021	0,002	-0,001	-0,003
All regulations	Announcement	-	0,000	0,000	0,000
All regulations	Implementation	-	-0,001***	-0,002	-0,001*
All regulations	Both	-	-0,001	-0,001	0,000

Table 12 The average cumulative abnormal returns of the companies split according to their level of executive compensation (EC) for an event window of (-1,1) using nonparametric tests for significance
Notes: The following table shows the average cumulative abnormal returns for the companies paying low executive compensation. The different regulations are split into their announcement and their implementation. Column (1) shows the type of regulations, column (2) whether it is the announcement or implementation, and column (3) shows the date of the announcement or implementation of the corresponding regulation. Column (4) shows the average cumulative abnormal return for the companies paying their highest-earning executive below the median, and column (5) shows the average cumulative abnormal return for the companies paying their highest-earning executive above the median. Column (6) shows the difference by subtracting column (4) from column (5). The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

REGULATION	ANNOUNCEMENT/ IMPLEMENTATION	DATE	AVERAGE CAR (-1,1) LOW EC	AVERAGE CAR (-1,1) HIGH EC	DIFFERENCE (4) AND (5)
Proxy Statement Disclosure	Announcement	26-07-2006	-0,003***	0,004**	0,007***
Proxy Statement Disclosure	Implementation	22-12-2006	-0,001***	-0,003	-0,002
Pay Ratio Disclosure	Announcement	05-08-2015	0,003***	0,002***	-0,001

			(1)	(2)	(3)
Pay Ratio Disclosure	Implementation	01-01-2017	0,001**	0,005	0,004*
Pay-Versus-Performance Disclosure	Announcement	25-08-2022	-0,002	-0,004	-0,002
Pay-Versus-Performance Disclosure	Implementation	16-12-2022	-0,003***	-0,009**	-0,006**
Tax Excessive CEO Pay Act	Announcement	17-03-2021	0,004	-0,004**	-0,008
All regulations	Announcement	-	0,000	0,000	0,000
All regulations	Implementation	-	-0,001***	-0,002**	-0,001
All regulations	Both	-	0,000	-0,001	-0,001

Table 13 Regression on the abnormal return

Notes: The following table shows the results of the regression on the abnormal return of the companies considered in the sample. Column (1) shows the different variables and column (2) the coefficients of the variables. The level of significance is indicated by the number of stars, *, **, ***, which represent the significance levels of respectively 10%, 5%, and 1%.

	ABNORMAL RETURN
ANNOUNCEMENT PROXY STATEMENT DISCLOSURE	-0.001*
IMPLEMENTATION PROXY STATEMENT DISCLOSURE	0.000
ANNOUNCEMENT PAY RATIO DISCLOSURE	0.001*
IMPLEMENTATION PAY RATIO DISCLOSURE	-0.001
ANNOUNCEMENT PAY VERSUS PERFORMANCE DISCLOSURE	-0.002***
IMPLEMENTATION PAY VERSUS PERFORMANCE DISCLOSURE	-0.001**
ANNOUNCEMENT TAX EXCESSIVE CEO PAY ACT	0.001
CONSTANT	0.001