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ESG-Linked Executive Compensation and Financial Firm Performance: The Moderating Effect of Compensation Horizon and Board Independence

Evidence from the S&P500 (2010-2019)

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PREFACE AND ACKNOWLEDGEMENTS

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ABSTRACT

This paper studies the effect of environmental, social and governance (ESG)-related executive compensation on financial firm performance, as measured by return on assets (ROA) and Tobin's Q. The degree of ESG-related compensation is proxied by a self-constructed score using text mining within the proxy statements of S&P500 firms, which is a major contribution of this study. Moreover, long-term compensation and board independence are used as moderators to examine their interaction effect with ESG-related executive compensation, expecting a positive effect of both long-term compensation and board independence. The investigated data sample consists of 3325 firm-year observations of S&P500 companies between 2010 and 2019. Performing ordinary least squares (OLS) regressions, the results suggest that there is a significant relationship between ESG-related compensation and financial firm performance. This is the case for ROA as well as Tobin's Q. No significant moderating effect has been found for long-term compensation and board independence.

Keywords: Financial Firm Performance, Long-term Compensation, Board Independence, ESG-related Compensation, Text Mining

JEL Classification: G34, J33, L25, Q01

LIST OF ABBREVIATIONS

ESG	Environmental, social and governance
CSR	Corporate social responsibility
CSP	Corporate social performance
KPI	Key performance indicator
LTIP	Long-term incentive plan
STIP	Short-term incentive plan
ROA	Return on assets
WRDS	Wharton Research Data Services
EDSC	Erasmus Data Service Centre
OLS	Ordinary least squares
VIF	Variance inflation factor

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1. Introduction

Over the past years, the demand on companies to tie in incentives through products and services that result into immediate good for society has increased. Several important developments such as global warming are the driving factor behind this pressure cooker, with expectations still continuing to increase. Nowadays, sustainability targets are commonly implemented alongside conventional key performance indicators. Although this may partly be due to the fact that companies want to improve their reputation, academic research points out that sustainable improvements can create value for a firm's shareholders (Khan, Serafeim & Yoon, 2016). Today, it is secure to say that for (public) companies to remain respected and retain its competitive advantage, it is a necessity to set measurable ESG targets too. Besides, when looking at the broader spectrum of society, politics, companies and investors, ESG goals are becoming an integral part of decision-making and the increasing expectations towards corporate social responsibility (CSR) are ubiquitous.

Decades ago, companies began developing projects to promote concepts like community service, energy conservation and recycling. Engaging in such projects became the ground for CSR, which included aims such as gender equality, environmental sustainability and diversity. While CSR focuses on the general notion of businesses' accountability or responsibility to society, corporate social performance (CSP) is rather an extension of this concept that focuses on actual results achieved (Sage Publishing, 2012). Customer loyalty, employee engagement and earnings performance all improved as a result of the CSR efforts (Kurucz, Colbert & Wheeler, 2008). These improvements, however, were not clearly linked to pay, possibly because they were too difficult to measure. This is changing. ESG metrics are becoming standardized and investors are increasingly demanding transparency and disclosure. Today, almost half of the FTSE 100 companies set measurable ESG targets for their executives by, amongst others, introducing ESG-related compensation plans. Therefore, it is nowadays crucial for companies to understand the implication on ESG-related compensation on financial firm performance, how to design these sustainable incentive schemes and how governance mechanisms can be used to improve productivity. For that reason, this study examines the following research question:

What is the association between ESG-related executive compensation and financial firm performance?

This thesis expects a positive effect of ESG-related executive compensation on financial firm performance. Besides, it is to be expected that as the time horizon of reaching full compensation increases, this effect will be more pronounced because most benefits of CSR areas are reflected on the long-term and investments in CSR may negatively affect short-term financial performance. The same holds for the governance mechanism of board independence, which is expected to positively moderate

this effect. The monitoring function of independent board members is expected to ensure executives to engage in CSR in order to eventually improve financial performance.

According to an article of O'Connor, Harris & Gosling (2021), incorporating ESG measures in executive remuneration schemes is a practical method to induce companies to actually execute what they say when it comes to sustainable initiatives. Large enterprises like Rio Tinto, Apple, Unilever, Royal Dutch Shell and McDonald's have announced to link executive compensation to ESG goals. Rio Tinto, for example, announced to redesign its short-term compensation plan for their executives by lowering the individual performance component from 30% to 15%, allocating the remaining 15% to ESG goals. However, there are multiple ways for remuneration committees to design ESG-related incentive plans for their executives: internal (e.g., developments in diversity initiatives or investments in green technology) and external targets (e.g., stakeholder impact or decrease in emissions produced); individual key performance indicators (KPIs) and scorecards (in order to keep track of and measure progress towards ESG goals); long-term incentive plans (LTIP) and annual bonus. In the last case, the question is what time frame will be the most effective. Environmental goals are likely to settle within the long-term incentive plan due to their long-term orientation (O'Connor et al., 2021).

Besides reaching ESG goals, the question arises whether implementing ESG-related compensation affects a company's financial firm performance. More than 75% of top executives agree that solid ESG performance is a critical contributor to financial performance, according to a report by Willis Towers Watson (2020). Due to the rising public attention around CSP, it can be assumed that more firms will be implementing ESG targets in their compensation plans. It is probable that companies will motivate their managers to invest and engage more in CSR initiatives by means of these ESG-related incentive plans. In fact, this could lead to an improved long-term financial firm performance (Flammer, Hong & Minor, 2019). It can also be important for firms to assess what governance mechanisms they can implement to improve the efficiency of implementing ESG-related compensation plans. For instance, board composition and independence are likely to be a driving factor behind this efficiency (Haque, 2017).

Conducting research on this topic is relevant because CSR, CSP and ESG are globally becoming increasingly important. Should companies indeed implement ESG-related compensation plans? And how should companies design their incentive schemes? Do long-term or short-term incentive plans render the optimal outcome, thus lead to better financial firm performance? What role can governance tools play in this light? This thesis can give firms direction on these questions. In the fast-changing CSP environment, this study first of all aims to contribute to the existing literature by providing recent, up-to-date evidence. Besides, there is extensive previous literature that focuses on the effect of (long-term and short-term) financial pay-performance relationship. However, studies that focus on the relationship between ESG-related compensation (independent variable) and financial firm performance (dependent

variable) are very scarce. This paper is one of the first to proxy the degree ESG-related compensation by constructing a score based on text mining in proxy statements with ESG-related compensation indicators – especially in combination with financial firm performance as dependent variable. Moreover, there is no literature that investigates this research question in combination with both compensation horizon and a governance mechanism like board independence as moderators. Therefore, this paper makes a contribution to the existing spectrum of academic literature. Hereby, this thesis aims to play a part in creating a wider financial view of sustainability and firm performance and what role executive compensation plans can play in this context for both shareholders and stakeholders.

The remainder of this paper is structured as follows. Chapter 2 contains the theoretical framework of this study, elaborating on several definitions and theories. Moreover, the chapter reviews a range of existing literature related to the topic and proposes the hypotheses. Chapter 3 describes the data sample and the variables, followed by Chapter 4 elaborating on the research methodology. The findings of empirical analyses as well as a robustness test are reported in Chapter 5. The last chapter draws conclusions, offers recommendations for future research and evaluates the shortcomings of this study.

2. Theoretical Framework

This chapter will introduce several theories and explain the concepts of ESG-related executive compensation and the board of directors. Besides, the existing literature will be reviewed in order to provide ground to formulate the hypotheses. The goal of this chapter is to show what the different theories and historical papers entail, how they are interrelated and to provide the economics that underly each hypothesis.

2.1. Agency Theory

Executive directors (agents) are in a powerful position. They have more control over a company's information, choices and actions. Shareholders (principals) have little way of verifying whether the executive directors are striving to maximize firm value. In fact, it is difficult for the principal to evaluate the agent's actions. The agency theory tries to describe the interaction between the principal and the agent and the problems that may emerge from this relationship (Eisenhardt, 1989). There are two approaches to agency theory that have evolved over time: the positivist and the principal-agent approach. Positivist researchers concentrate on situations where the principal and agent are likely to have opposing interests. They undertake research on the principal-agent relationship (between executives and shareholders of large, listed companies) and describe the governance systems that can constrain the agent's self-serving behavior. Managerial opportunism, for example, can be reduced by providing an executive with more company ownership. Furthermore, the board of directors can play in important role in addressing the lack of transparency about remuneration plans and thereby controlling managerial behavior (Eisenhardt, 1989). The principal-agent approach is rather concerned with determining the best contract between the principal and the agent in terms of behavior versus outcome. When the principal has complete knowledge of the agent's actions, a contract based on behavior is likely to be the most efficient. Like all other employees, an executive works in exchange for money or other incentives. If this trade mechanism would function effectively, this type of contract wouldn't be problematic. However, in practice it does not hinder the CEO from pursuing his own agenda (Eisenhardt, 1989). Moreover, the principal appears to be under-informed. The agency theory, nevertheless, implies that it is possible to design a remuneration package that aligns the interest of both the agent and the principle, motivating the agent to act on behalf of the principal as well. It is critical to strike a proper balance between performance on the one hand and rewards on the other in order to build an effective package. Rewards should be attainable, measurable, not easily manipulated and linked to goals that benefit shareholders. According to Praag (2005), the following are often utilized components of a performance-based compensation: (1) Shares. The more shares an executive owns, the more his compensation depends on performance of the company, aligning the principal-agent conflicts of interest. Shares are assigned on the base of performance measures in the LTIP. (2) Options. Options give executives the possibility to exercise shares in the future. When the company performs well, the exercise price will be higher and vice versa. Options are also assigned based on performance measures

in the LTIP. (3) Bonuses. Bonuses belong to the cash part of the compensation plan and are generally linked to short-term financial performance targets.

Friedman (2007) suggested that the presence of CSR within a corporation can indicate the possibility of agency problems due to conflicting interests among stakeholders. The author argues these agency problems arise since engaging in CSR is a waste of a firm's resources. Instead, these funds should be used to make investments that result in a direct financial advantage for shareholders. As a result, proponents of investing in CSR and proponents of straight profit maximization have conflicting objectives. Another agency issue that may occur is when managers over-invest in CSR efforts in order to boost their own reputation, which diverts their attention away from the firm's fundamental goal: maximizing shareholder returns. Ultimately, over-investing will result in a decrease in profit (Barnea & Rubin, 2010). On the other hand, the agency theory may stimulate CSR through mutually encouraging behavior within the principal-agent relationship. In the principal-agent relationship, companies that engage in CSR could be regarded both agents and principals. When a company is deemed an agent, it must first focus on its relationship with principals (e.g., consumers, suppliers, the government, employees). The principals can exert pressure on the company to behave in a socially responsible manner, thereby improving CSR. Secondly, when a company assumes the role of principal it can stimulate its agents to engage in CSR. For example, when a company applies widely accepted CSR principles as internal standards, protocols and policies, it directs its staff to behave socially responsible. To summarize, CSR does not always result in a conflict of interest but can also lead to mutually encouraging behavior. For that reason, the agency theory could provide explanation for companies to engage in CSR and, for instance, implement ESG-related compensation plans.

2.2. Stakeholder Theory

Freeman (1984) was the first one to propose the stakeholder theory, which states that in order to thrive, managers must satisfy all the interests of the various stakeholders (McWilliams & Siegel, 2001). This is contrary to Friedman's neoclassical viewpoint, which argues that businesses should solely seek to satisfy shareholders. Stakeholders are referred to as any group or individual who can affect, or is affected by, the actions of an organization (Freeman, 1984). Shareholders, suppliers, employees, customers and investors are primary stakeholders. Government, communities, environmental organizations and the media are secondary stakeholders (Clarkson, 1995). According to Bird, Hall, Momentè and Reggiani (2007), it is important to not ignore the interests of secondary stakeholders. When exclusively focusing on primary stakeholders, companies are less likely to succeed. In reality, however, companies frequently do not respect the interests of all stakeholders equally, preferring to prioritize the interests of specific stakeholder groups. Generally, firms will aim to please the most influential stakeholders because they are viewed as more crucial for the firm's existence (Deegan & Unerman, 2006). This goes against the stakeholder theory's core tenets. Jensen (2001) has a possible answer to this problem, proposing the enlightened stakeholder theory. Managers should try to maximize

the company's long-term value, according to this theory. Keeping this in mind, the enlightened stakeholder theory allows managers to make the necessary trade-offs between various stakeholders. According to Post, Preston and Sachs (2002), the potential of a company to develop long-term wealth and value is determined by the relationship it has with its stakeholders. Freeman (1984) also supports this view, stating that a company will be more successful in the long run if it improves its capability to manage relationships with a variety of stakeholders. CSR can also be related to the stakeholder theory. Prior, Surroca and Tribó (2008) discovered that maximizing CSR is positively associated with satisfying the interests of stakeholders. In conclusion, the stakeholder theory can explain why companies engage in CSR. Moreover, it can be used as an explanation for adopting ESG-related compensation plans, because engagement in CSR activities is expected to boost the firm's long-term value by actively managing all essential stakeholder relationships (Bird, Hall & Momentè, 2007).

2.3. Legitimacy Theory

According to the legitimacy theory, a firm's success is determined by how society perceives the appropriateness of the firm's operations. As a result, in order to survive, firms must behave in a legitimate manner (Lindblom, 1994; Deegan, 2002). That is the only way for companies to avoid social condemnation (Kaplan & Ruland, 1991). For the reason that society is ever changing, companies must anticipate fast in order to stay in line with the societal norms and values (Deegan & Unerman, 2006). According to Balabanis, Phillips and Lyall (1998), companies feel the responsibility to operate ethically because society allows them to use its natural resources and human capital. Why do firms not always live up to societal expectations? As a result of expectations constantly changing, acceptable behavior is no longer considered acceptable. Another factor could be specific incidents (such as environmental disasters) that have harmed the organization's reputation. Organizations are not as reactive as they appear to be. They only react when it becomes clear that their position is jeopardized. Organizations are rather proactive, meaning they always aim to guarantee that they operate within the constraints of their particular societies. In other words, companies attempt to ensure that their operations are viewed as legitimate by outside parties (Deegan, 2002). Thus, it is not always easy for companies to operate in line with the demands of society. As a result, a so-called legitimacy gap can arise. These kinds of gaps can form a risk to an organization unless it implements a proper legitimization strategy. Lindblom (1994) proposed four legitimization strategies that an organization could use to legitimize its operations to society: educate relevant stakeholders about the organization's actual performance; change relevant stakeholders' perceptions about the underlying issue without changing the organization's behavior; distract or manipulate attention away from the issue of concern and redirect it to a favorable issue; change external expectations about the organization's performance. Considering these strategies, it becomes apparent that the legitimacy theory emphasizes the strategic importance of corporate disclosure. Corporate social reporting is one type of corporate disclosure. CSR reporting, according to the legitimacy theory, strives to positively influence stakeholders' and society's opinions of an

organization's operations by delivering information in such way that the company is considered as socially responsible (Hooghiemstra, 2000). CSR reporting follows from engagement in CSR / ESG activities. Engaging in such activities can increase a firm's (perceived) appropriateness by society. Therefore, the legitimacy theory can explain the implementation of sustainable remuneration policies.

2.4. Defining ESG-Related Compensation

ESG-related compensation plans are financial incentive schemes for executives linked to environmental, social and governance performance, in order to increase the accountability of executives for the delivery of sustainable business goals (Karananou & Mooney, 2016). As CSR and CSP becomes more popular, an increasing number of companies include these ESG goals in their executives' remuneration plans. According to previous studies, these targets should be included in remuneration plans for a variety of reasons. First of all, Waddock and Graves (1997) argue that incorporating these targets has a favorable impact on financial firm performance. According to Ricart et al. (2005), environmental targets should be included in CEO compensation, such that executives consider a wider spectrum of stakeholders and engage in investments in sustainable development. Moreover, integrating environmental targets in compensation schemes encourages managers to improve ESG performance by, for instance, enhancing community relations or lowering carbon impact (Flammer et al., 2019). However, ESG performance is difficult to control and monitor. Are ESG targets actually utilized to ameliorate CSP or is it just showmanship? This can be complex to assess (Kolk & Parego, 2014). Despite this fact, most of the studies have demonstrated that these ESG criteria in compensation contracts have beneficial impact on CSP. The goal of this study is rather to dig deeper into the link between ESG-related compensation and financial firm performance. So, what does an ESG-related compensation look like? How is such compensation plan designed? Willis Towers Watson (2020) performed a survey based on 168 executive or non-executive directors, representing companies that employ more than 2 million people worldwide. Their survey shows that nearly 63% of the companies incorporate ESG-related compensation in short-term incentive plans (STIP) (e.g., bonuses), alongside 41% of the companies factoring ESG into LTIP. According to Willis Towers Watson (2021), commonly used ESG metrics in compensation plans are the reduction of greenhouse gas emissions, employee safety, diversity & inclusion and customer satisfaction. Of all companies with ESG metrics, 35% are measuring them quantitatively. Moreover, 47% of US companies incorporate one or two ESG categories into their incentive plans (e.g., E and S, or S and G), while only 9% of companies use a combination of all three ESG categories. It is also interesting to note that ESG-linked executive compensation, in contrast to conventional compensation, does not yet incorporate peer group evaluation. LTIP, for instance, is often determined by how well a company performs in comparison to a peer group of similar businesses. Compensation based on peer groups ensures that subpar management teams don't seem to outperform and the opposite. Similarly, ESG-related remuneration could be evaluated by, for example, a company's carbon reductions in comparison to its competitors. However,

this requires trust in the measurement of the emissions of peers. Opportunities for comparing performance ought to be expanded as ESG activity measurement continues to develop (Ritz, 2022). It is important to note that some companies solely use ESG-related compensation plans for their CEOs, while other companies use these plans for the whole board or even all senior managers within the company. Therefore, 'executive compensation' will be used as general terminology in this thesis.

2.5. Defining the Board of Directors

The board of directors within a company is an internal governance mechanism, appointed by the shareholders to monitor the performance of executives, avoid conflicts of interest and maximize shareholder value (Fama & Jensen, 1983; Williamson, 1984). Also referred to as the non-executive board, it is regarded as a crucial governance technique since it creates an intermediary group between shareholders and executives (Baysinger & Hoskisson, 1990). The responsibilities of the board of directors are described by Zahra and Pearce (1989), utilizing four theoretical approaches. The first one is the legalistic role, which states that the board's responsibility is to deliver corporate leadership and safeguard the interests of the shareholders. The second is the resource dependence role, which implies that the board's responsibility is to bring in external key resources and reduce the company's uncertainty. Thirdly, the hegemony role argues that it is the board's purpose to preserve the power of those in power by supporting the top management's actions. The final and most widely used approach is the earlier discussed agency theory (section 2.1), which views the board's most important duty as overseeing managers' actions in order to ensure efficiency and shareholder profit (Zahra & Pearce, 1989). Two important features of the board of directors are executive remuneration and board independence (Denis & McConnell, 2003). This thesis examines the moderating effect of these features on the relationship between ESG-related executive compensation and financial firm performance.

2.6. ESG-Related Compensation and Financial Firm Performance

2.6.1. ESG-Related Compensation and ESG Performance

Previous literature provides evidence on the fact that when remuneration incentives are used for executives, this aligns the interests of the agent with the interests of the principal (Makri, Lane & Gomez-Mejia, 2006; Deckop, Merriman & Gupta, 2006; Bonner & Sprinkle, 2002). With respect to ESG performance, this incentive mechanism can be deployed to align the interests of executives and all the firm's stakeholders. Almost two decades ago, Jensen, Murphy and Wruck (2004) wrote about the rising importance of companies' ESG performance, but also noted that often compensation does not include explicit and direct incentives aimed at enhancing this performance. By then, compensation incentives mainly focused on targets involving stock-based and accounting measures of a firm's performance. Nowadays, this has changed: 83% of S&P 1200 companies included a form of ESG-related incentives in their compensation plans (Report of Principles for Responsible Investment, 2016). To illustrate: in 2019, sustainable development continued to account for 20% of Shell's executive short-

term incentive plan. 10% to safety (personal safety and process safety), alongside 10% environment (intensity of gas and chemicals). For their LTIP, Shell includes a three-year target to reduce net carbon footprint, entailing 10% of the LTIP (Royal Dutch Shell, 2019).

Hong, Li and Minor (2016) investigated the relationship between ESG-related executive compensation and CSR. They pointed out that companies with corporate governance that is more shareholder-friendly are more likely to pay managers based on the firm's social performance. Furthermore, the authors found that offering the management direct financial incentives for engaging in socially responsible activities is a powerful instrument for improving both CSP and shareholder return. The findings show that corporate governance is an important factor in determining managerial incentives for CSP, and that CSR initiatives are likely to benefit shareholders. The study also supports the agency theory, which contends that when corporate leaders are (financially) motivated, they are more likely to behave in the best interests of stakeholders as well as shareholders. More recently, a study by Okafor and Ujah (2020) examines how efficient it is to use remuneration plans as tool for managers to engage in CSR, specifically zooming in on the effect of a golden parachute on an executive's behavior towards CSR. They find that a golden parachute positively increases a firm's CSR performance. This implicates that adding a golden parachute contractual clause to the executive compensation package will lead to the CEO ensuring that the company only engages in value-adding CSR initiatives. Moreover, it should align the firm's own interests (maximization of shareholder value) with the interests of society and other stakeholders (more CSR activity). Maas (2018) studies how CSP is affected by setting ESG targets in managers' incentive plans, more specifically investigating the effect of hard and soft CSP targets. The findings of the paper indicate that a firm's level of CSP has no significant effect on the use of CSP targets and that the use of CSP targets in compensation plans in general do not automatically lead to better CSP results for firms. However, the use of quantitative, hard CSP targets in executive compensation is an effective way for companies to improve their CSP results – it especially lowers CSP weaknesses.

2.6.2. ESG Performance and Financial Firm Performance

Waddock and Graves (1997) explored the relationship between CSP and financial firm performance in the United States. They came to the conclusion that CSP and financial firm performance are positively related. They also found that higher financial performance leads to higher CSP, as well as the inverse: a simultaneous relationship. They explain this simultaneity based on several theories. The positive effect of financial firm performance on CSP can be declared by the slack resources theory: firms that perform better (i.e., are more profitable) will generally have more resources and therefore invest these resources more heavily in CSP. According to Waddock and Graves (1997), one of the possible explanations for the positive effect of CSP on financial firm performance is that this effect represents simple 'posturing' on the part of companies to improve external reputation: managers are not fully committed to improved CSP, but they invest the minimum to avoid significant bad publicity. Control

variables include size, risk and industry. Lin, Yang and Liou (2009) conducted their research on the impact of CSR on financial performance in Taiwan. They also drew the conclusion that good CSR investments lead to better financial performance in the long run, alongside the finding that companies with significant R&D expenditures have good financial performance. Orlitzky et al. (2003), Margolis, Elfenbein and Walsh (2009) and Allouche and Laroche (2005) performed meta-analyses, summarizing the overabundance of the different studies within this topic.

Orlitzky et al. (2003) identified 52 papers from 1990 to 1997 with a total sample size of over 34.000 observations in their meta-analysis. Across all studies, they found a positive link between CSR and financial performance. The degree to which this link is positive is determined by factors such as measures of financial performance, reputation effects and CSR disclosures. They also discovered that when accounting-based financial performance measurements are employed instead of market-based measures, CSR is more strongly associated with financial performance. They further stated that the relationship between CSR and financial performance is bidirectional. Additionally, they argue that sample inaccuracy, stakeholder mismatching and measurement mistakes are the primary reasons of the discrepancies in published results. It is worth noting, however, that this meta-analysis relies on 30 different dependent variables. Furthermore, there is a lot of variation in CSR metrics. Margolis et al. (2009) also conducted a comprehensive meta-analysis and found a slightly positive average association between CSR and financial performance, which is similar to the findings of Orlitzky et al. (2003). They examined 167 papers from 1972 to 2007 and concluded that 27% of them had a positive association, 2% had a negative association and 58% had a nonsignificant association between CSR and financial performance. Because the authors did not publish sample size, the remaining 13% could not be assessed for significance. They used a vote-counting method that gives equal weights to all results. This could explain why, in comparison to Orlitzky et al. (2003), they found a weaker overall positive association between CSR and financial performance. Lastly, a meta-analysis of the relationship between CSR and financial performance was also published by Allouche and Laroche (2005). They used a multivariate framework to analyze 373 observations from 82 studies conducted between 1972 and 2003, agreeing upon the fact that CSR had positive impact on financial performance, confirming the findings of Orlitzky et al. (2003) and Margolis et al. (2009). Moreover, they showed that this impact was the greatest in the United Kingdom.

Table 1: Highlights of historical research on the association between ESG-related compensation and both CSP and financial firm performance

Author	Dependent / independent variables	Control variables	Sample	Method	Results
Waddock and Graves (1997)	The dependent variable is CSP and the independent variable is firm performance (ROE, ROA, return on sales)	Debt-to-assets ratio, total sales, total assets, number of employees	469 observations from the S&P500 in 1990	OLS regressions	Positive effect of CSP on financial firm performance and vice versa.
Lin, Yang and Liou (2009)	The dependent variable is firm performance (ROA) and the independent variable is CSR	The R&D investments of a firm	33 observations from the top 1000 (sales) Taiwan-based companies between 2002-2004	OLS regressions	Good CSR investments have positive effect om financial performance in the long-run.
Hong, Li and Minor (2016)	The dependent variable is CSR and the independent variable is CSR-related compensation (dummy)	ROA, firm size (sales), leverage, CEO tenure, industry	2561 firm-year observations from S&P500 in 2013	Logistic regressions	Positive relation between CSR-related compensation and CSR.
Maas (2018)	The dependent variable is CSP and the independent variable is CSP targets in executive compensation	The existence of a CSP committee, ROA, firm size (total assets), year fixed effects	1846 firm-year observations from S&P500 between 2008-2012	OLS regressions	CSP targets do not have a positive effect on CSP. Hard, quantitative CSP targets do improve CSP (lowers CSP weaknesses).
Okafor and Ujah (2020)	The dependent variable is CSR and the independent variables is executive compensation	Firm size (sales), firm performance (cash flow), capex, firm age	13295 firm-year observations from US firms between 1993-2013	OLS regressions	Golden parachute and long-term compensation jointly and positively increase a firm's CSR performance.

2.7. Executive Compensation Time Horizon

One of the first influential authors on remuneration policy are Jensen and Murphy (1990). They use the conflict of interests between the shareholders and the CEO of a publicly traded firm as a classic example of a principal-agent dilemma in their article. Shareholders do not have full knowledge of a CEO's managerial actions and the investments he chooses to engage in. The CEO, like most people, is more concerned with his own prosperity than with maximizing shareholder wealth. To ensure that the CEO acts in the best interest of the shareholders, his personal interest must align with those of the shareholders. Therefore, one of the most critical aspects of an organization's success is its compensation strategy. Jensen and Murphy (1990) were the first to explore *how* CEOs are paid instead of *how much* they are paid. Do long-term or short-term compensation plans result in the optimal financial firm performance?

2.7.1. Long-Term Executive Compensation and Financial Performance

LTIPs link the CEO's interests with shareholder value. The majority of earlier research (Bryan et al., 2000; Aboody et al., 2004) have focused on long-term incentives – which are usually equity-based – and their link with firm performance. As it clearly aligns the CEO's wealth to changes in the market value of a company, the use of equity-based compensation as a long-term pay incentive is effective (Bryan et al., 2000). According to Conyon (2006), shareholders prefer equity-based compensation since a CEO with a lower percentage of the company's stock ownership behaves more opportunistically and therefore risky. Since it connects the CEO's financials interests with the shareholders' demand for long-term business success to grow shareholder wealth, share ownership improves the principal-agent relationship. Firms, therefore, should avoid paying CEOs based on short-term results, according to Bebchuk & Fied (2010). They likewise argue that equity-based remuneration is a critical component of the CEO compensation package to create long-term value. In line with the aforementioned papers, Jensen, Murphy and Wruck (2004) show that cash compensation (i.e., salary and bonus) only forms a small portion of total remuneration and the pay-performance sensitivity appears to increase dramatically when the added value of shares and stock options are included.

2.7.2. Short-Term Executive Compensation and Financial Performance

Short-term incentives motivate the CEO to meet the company's annual business objectives. Annual performance-based rewards are what they are called. The majority of these incentives are cash based, such as a yearly cash bonus (Lerner & Wulf, 2007). Prior research on the effect of short-term incentives is inconsistent in its conclusions, but equity-based remuneration is regarded to be a more effective tool for incentivizing CEO's interests to build shareholder value in the short and long term, rather than cash compensation (Frydman & Jenter, 2010). Annual cash compensation (base salary and bonus) has a minor positive impact on the firm's ROA in the following period (Jensen & Murphy, 1990). However, Gerhart & Milkovich (1990) do not find any significant relationship between base salary and financial firm performance. Additionally, Jensen and Murphy (1990) report that annual salaries and bonuses increase by 1% for every 10% increase in business value. This means that previous year's market performance has significant impact on this year's cash remuneration. Mehran (1995) finds a negative association between cash compensation as a percentage of total compensation and financial firm performance expressed in ROA.

2.7.3. Compensation Time Horizon and ESG Performance

Deckop et al. (2006) study the association between short-term and long-term focus in CEO pay and CSP. The authors discover that a short-term focus in CEO remuneration is negatively associated with CSP, while a long-term focus is positively related. These results can be explained by a variety of factors. The majority of CSP areas are more likely to have beneficial long-term pay-outs than they are to have favorable short-term benefits. Although CSP can have short-term reputational consequences (Orlitzky, Schmidt & Reynes, 2003) and hence affect stock price, short-term CEO remuneration is mostly based

on accounting performance rather than stock price (Murphy, 1999). For that reason, it can be argued that CEOs with a short-term focused compensation scheme have little incentive to engage in CSP initiatives. In fact, Deckop et al. (2006) argue that executives have a particular financial disincentive to engage in CSP when their compensation plan has a short-term accent. Some aspects of CSP namely involve taking action in the areas of diversity, fairness in hiring, community relations, the environment and the safety of a firm's product or service, which may have direct negative effect on short-term financial performance. All the more, it may represent an opportunity cost for the CEO, in that resources spent on improving CSP represent resources not spent in maximizing short-term performance (Margolis & Walsh, 2003). Failure to be able to reach good short-term numbers can affect both CEO pay and CEO job security. This suggests that a lack of scrutiny of CSP can have positive short-term financial effects, while the long-term effects are likely to be negative (Deckop et al., 2006).

Mahoney and Thorn (2006) investigate how boards utilize executive compensation to motivate companies to pursue social and environmental goals. They look at the relationship between executive compensation and CSR in 77 Canadian companies by considering three main components of executive compensation: salary, bonus and stock options. In addition, three other components of CSR are taken into account: total CSR, CSR strengths and CSR weaknesses. The authors' findings include a positive relationship between salary and CSR weaknesses and a positive relationship between stock options and CSR strengths. The first relationship can amongst others be explained by the concept that higher salaries traditionally have been associated with increased managerial hubris, or overconfidence (Hambrick & Frinklestein, 1995). As salary levels get higher, the attention of executives becomes less focused on stakeholders' interests. This means that managers will be less inclined to make decisions that consider the best interest of society. The positive relationship between stock options and CSR strengths can be declared by the fact that stock options are the typical form of long-term incentive compensation, aiming to focus executives on increasing future stock value. When an executive makes long-term investments by engaging in CSR activities, his or her wealth will increase proportionally when the stock price increases (Mahoney & Thorn, 2006). Moreover, socially responsible firms are willing to forgo short-term profits to invest in environmental and social goals, which benefit all stakeholders in the longer run but have no immediate payoff (Kane, 2002).

Berrone and Gomez-Mejia (2009) find support that CSP is positively affected by long-term pay of executives. This positive association can be attributed to the fact that compensation in the form of stock options is positively related investing more heavily in risky long-term ESG projects – because these projects *require* long-term commitment. This can improve a firm's long-term (environmental) performance. Moreover, their results suggest that compensation plans with a long-term pay focus also improve environmental performance by positively influencing the prevention of pollution. The article also emphasizes that the quality of environmental governance systems is an important determinant of executive compensation, alongside the finding that executive compensation increases when a firm has

good environmental performance. This shows the reversed relationship of these variables. The key implication of the study of Berrone and Gomez-Mejia (2009) is that compensation plans with a long-term focus are of importance in improving environmental performance, especially in polluting industries.

2.8. Board Independence

In comparison to internal directors, who are typically focused on achieving lucrative short-term goals, independent directors have separate goals, values, and time horizons (Post et al., 2011). Boards of directors are referred to be the entity that primarily protects the interest of all relevant stakeholders. Therefore, having both executives and non-executives on the board is critical for gaining substantiating stakeholder involvement (Fuzi et al., 2016). What are the implications of board independence for firm performance?

2.8.1. Board Independence and Financial Performance

Independent directors are considered to play a bigger role in managerial oversight than internal board members (Fama, 1980). Due to agency issues, shareholders benefit from a closely watched management, according to Rosenstein & Wyatt (1990). They illustrate that the proportion of outside directors affects shareholder value by showing a substantially higher stock price at the announcement of the appointment of an extra outside director. As such, many studies show that independent directors are better at monitoring management and protecting shareholder wealth than inside directors (e.g., Solomon & Solomon, 2004. According to Beasley (1996), outside directors minimize the possibility of financial statement fraud. Scherrer (2003) argues that independent directors are unconcerned about internal career chances, making them better capable of safeguarding the interest of shareholders. Weisbach (1988) found that in organizations with a majority of outside directors, CEO turnover is more strongly related to financial firm performance, showing that outside directors play a key role in monitoring the executive board. In their paper, Knyazeva et al. (2013) investigated the association between board independence and firm performance. Using Tobin's Q and ROA to assess firm performance, they concluded that board independence is positively related to both firm performance and value, supporting the agency theory. These findings match those of Terjesen et al. (2016), who performed a comparable study on the link between independent board members and firm performance. Whereas Knyazeva et al. (2013) exclusively looked at enterprises based in the US, Terjesen et al. (2016) considered a sample of 47 different countries, providing evidence for the existence of the relationship outside the US. In his study, Buchwald (2017) looked at European listed companies between 2003-2011 and reported that having more outside directors on the board improves the firm's performance, especially when product market competition is mild. Liu, Miletkov, Wei and Yang (2014) also provide evidence in line with the aforementioned studies, but their paper is the first comprehensive study on solely China. The authors used ROA as a measure for firm performance. Some other single-country studies also find that board independence has a positive impact on firm performance. Black and Khanna

(2007), Dahya and McConnell (2007) and Black and Kim (2012) all investigate country-specific regulatory shocks and conclude that greater board independence significantly increased financial performance in India, the UK and Korea, respectively. Coles et al. (2008) discover a positive relationship between the percentage of insiders on the board of directors and the financial performance of high-tech enterprises as measured by Tobin's Q. They argue that insiders with more firm-specific information enhance innovative technology firms. Nevertheless, there are also studies that report a non-significant and even negative relationship between board independence and firm performance. For example, Yermack (1996) discovers a negative relationship between Tobin's Q, his firm performance metric, and the proportion of external directors on the board. His study contains a sample from 1984 through 1991, including 452 large American industrial businesses. In their study, Bhagat and Black (1999) also investigate this, using a sample of large American listed firms. They demonstrate that a higher ratio of independent board members does not lead to increased profitability or faster growth. Tobin's Q and ROA were being used as indicators of profitability.

2.8.2. Board Independence and ESG Performance

In addition to the evidence on financial firm performance, the broad literature on corporate governance shows that the board's independence has a favorable effect on a firm's ESG performance. Jizi et al. (2014), for example, discovered a significantly positive relationship between board independence and CSR activities. They suggest that having independent external directors on the board will improve the board's monitoring capabilities, ensuring the protection of shareholder's social interests. Additionally, they argue that independent directors are inclined to focus on long-term goals that could be achieved by CSR investments, rather than short-term goals. Investigating firms listed on the Johannesburg Stock Exchange between 2002-2009, Ntim and Soobaroyen (2013) find that independent board members increase management supervision by allowing executives to engage in sustainable CSR initiatives that benefit their companies' financial success, using Tobin's Q as performance proxy. Liao et al. (2019) argue that independent directors are more capable of involving all the stakeholders and developing strategies that balance short- and long-term objectives, positively moderating the association between CSR and financial firm performance (Liao et al., 2019). Velte (2021) addresses quantitative meta-analyses on corporate governance-related determinants of CSR performance. Corresponding with the aforementioned, the author finds that board independence is one of the key corporate governance factors that positively influences CSR performance. Moreover, Velte (2021) argues that this CSR performance increases financial firm performance.

Table 2: Highlights of prior research on the association between compensation time horizon and board independence on both CSP and financial firm performance

Author	Dependent / independent variables	Control variables	Sample	Method	Results
Mehran (1995)	The dependent variable is firm performance (ROA, Tobin's Q) and the independent variable is compensation structure (percentage cash- and equity-based)	Leverage ratio, firm size (book value of assets), growth opportunities, business risk	153 randomly selected manufacturing firms between 1979-1980	OLS regressions	Negative relation between cash compensation as percentage of total compensation and financial firm performance.
Deckop, Merriman and Gupta (2006)	The dependent variable is CSP and the independent variables are short-term and long-term pay focus	Firm size (employees), ROA, percentage of outside directors on the board	313 observations from the S&P500 in 2001	OLS regressions	Short-term focus in CEP pay is negatively related to CSP, while long-term focus is positively related to CSP.
Knyazeva, Knyazeva and Masulis (2013)	The dependent is firm performance (ROA, Tobin's Q) and the independent variable is % independent directors	Firm size, sales growth, firm age, institutional ownership	XXX observations from Compustat/CRSP firms between 1996-2006	2SLS regressions	Board independence has positive effect on ROA and Tobin's Q.
Ntim and Soobaroyen (2013)	The dependent variable is firm performance (Tobin's Q) and the independent variables are CSR index and CSR count. The variable independent directors is one of the interaction variables.	Audit firm size, capex, presence CSR committee, leverage, firm size (sales), industry and year fixed effects	600 firm-year observations of JSE listed firms between 2002-2009	Multivariate regressions	Board member independence is positively related to CSR engagement that benefit companies financial success.

2.9. Hypotheses

Prior research on the effect of ESG-related compensation on ESG performance mainly found a positive relationship (e.g., Hong et al., 2016; Okafor & Ujah, 2020; Maas, 2018), alongside the ubiquitous findings of a positive effect of ESG performance on financial performance (e.g., Waddock & Graves, 1997; Lin et al., 2009; Orlitzky et al., 2003). Therefore, this study hypothesizes that ESG-related compensation will create financial value: incorporating sustainable compensation plans will drive executives to increasingly engage in CSR initiatives, ultimately resulting in a better financial firm performance. Correspondingly, the first hypothesis is formulated as follows:

Hypothesis (1): Companies that have a higher ESG-related compensation score will have better financial firm performance.

Furthermore, existing literature indicates that long-term compensation is a better way to improve financial firm performance than short-term compensation. This is also the case when looking at ESG performance. Considering that historical studies indicate that the majority of ESG areas are more likely to have beneficial long-term pay-outs than favorable short-term benefits, this study hypothesizes that a longer-term focus in executive compensation plans positively moderates the predicted effect in the first hypothesis. The opposite is predicted for short-term compensation. As a result, the following hypotheses are formulated:

Hypothesis (2a): A long-term time horizon to reach full compensation strengthens the positive association between ESG-related compensation and financial firm performance.

Hypothesis (2b): A short-term time horizon to reach full compensation weakens the positive association between ESG-related compensation and financial firm performance.

Lastly, the historical literature on the relationship between board independence and both financial firm performance and ESG performance mainly finds a positive effect. Having independent directors on the board improves monitoring capabilities and therefore the ESG interests of shareholders will be safeguarded. Moreover, independent board members are assumed to increase executive supervision and let them engage in sustainable initiatives that will eventually benefit a company's financial performance. Hence, this study predicts a higher board independence to positively moderate the first hypothesis and vice versa. Accordingly, the following hypotheses are formulated:

Hypothesis (3a): A higher board independence strengthens the positive association between ESG-related compensation and financial firm performance.

Hypothesis (3b): A lower board independence weakens the positive association between ESG-related compensation and financial firm performance.

3. Data

This chapter discusses the composition of the dataset. First, the construction of the sample will be discussed. Second, the dependent, independent, moderating and control variables are defined. Third, several assumptions of OLS regressions are tested. Lastly, the descriptive statistics are presented.

3.1. Sample Construction

In order to gather enough observations and simultaneously provide up to date evidence, a recent time period that is neither to vast nor too small is chosen. Therefore, to evaluate the impact of ESG-related compensation on financial firm performance, annual data of the S&P500 between 2010 and 2019 is analyzed. The sample is composed using of a list CUSIP-codes of the S&P500 companies for which there is sufficient data. The necessary financial panel data on these companies is extracted from the Thomson Reuters Datastream database, which provides significant historical data including equity, index, commodity, bond, futures, options and economic data. Moreover, the Wharton Research Data Services (WRDS) database is used to attain all the SEC filings of the concerning proxy statements of the companies. Both databases are widely utilized in empirical finance. Data from Datastream and WRDS were merged using the CUSIP-codes. Firms of which there is missing data of one or more variables in a certain year are excluded from the sample. Following the common practice of empirical study, firms operating in the financial industry (SIC codes 6000-6999) are removed from the dataset since they are highly regulated. Furthermore, delisted companies are likewise not considered and therefore deleted from the sample. Ultimately, the final sample contains 3325 firm-year observations. Table 3 provides a synopsis of the sample: a general sample distribution in Panel A, a sample distribution by industry in Panel B and a sample distribution by year in Panel C.

Table 3: Sample overview

Panel A: Sample distribution

Selection	Number
Initial observations (firm-year)	8510
Financial industry observations (firm-year)	801
Missing observations (firm-year)	4384
Observations in final sample (firm-year)	3325

Panel B: Sample distribution by industry

Industry	Number	Percentage
Construction	40	1.20
Manufacturing	1591	47.85
Mining	217	6.53
Retail trade	330	9.92
Services	524	15.76
Transportation	540	16.24
Wholesale trade	83	2.50
Total	3325	100.00

Panel C: Sample distribution by year

Year	Number	Percentage
2010	325	9.77
2011	327	9.83
2012	334	10.05
2013	334	10.05
2014	336	10.11
2015	345	10.38
2016	339	10.20
2017	334	10.05
2018	326	9.80
2019	325	9.77
Total	3325	100.00

It is notable that the manufacturing industry accounts for the lion's share of the observations (47.85%), while the agriculture industry is not represented at all in the sample.

3.2. Defining Variables

3.2.1. Dependent Variable

The dependent variable in this research is financial firm performance. Two proxies for financial firm performance are used: ROA (accounting measure) and Tobin's Q (market measure). In previous literature, there is ongoing discussion on the validity of ROA and Tobin's Q as indicators of firm performance. Many have claimed that Tobin's Q is a better proxy for a firm's growth potential than its performance, notwithstanding the measurement issues. Others claim that accounting measures as ROA provide little insight into economic return rates (e.g., Fisher and McGowan, 1983). The fact that accounting returns are crucial in establishing executive compensation can serve as justification for utilizing ROA (Ely, 1991). Previous research has also proposed other metrics for financial firm performance, such as stock return. However, using stock return as a proxy for performance is mainly suitable for all-equity firms. The three proxies all have their own limitations but are still highly correlated and results should not be affected by the choice of the proxy (Mehran, 1995). Therefore, the two best fitting measures for the dataset, ROA and Tobin's Q, are chosen. The variable ROA is directly retrieved from Thomson Reuters Datastream. Determining Tobin's Q is somewhat more complicated. Tobin's Q can be calculated as the market value of assets over the book value of assets of a company. However, it is difficult to determine the market value of debt. According to Bowman (1980), there is little difference between the book and market values of debt, observing a high cross-sectional relationship between these values. Following this reasoning, market and book values of debt are assumed to be equal, representing a compromise between analytical precision and computational effort. Consequently, Tobin's Q is calculated as follows:

$$Tobin's\ Q = \frac{\text{Market Value of Equity} + \text{Book Value of Debt}}{\text{Book Value of Total Assets}}$$

Market value of equity, book value of debt and book value of total assets are all retrieved from Thomson Reuters Datastream.

3.2.2. Independent Variable

The independent variable in this study is a score on ESG-related compensation. However, there is no variable available from a database that quantifies such a score. The Thomson Reuters ASSET4 database, for example, only provides a dummy variable indicating whether a CEO's compensation is linked to ESG goals. In order to not look upon this issue in a binary way, this paper identifies indicators of ESG-related compensation and uses these as search keywords in proxy statements to create a score, counting

how often certain keywords appear in the concerning proxy statement. Similar ways of creating a variable have also been used in previous studies (e.g., Flammer et al., 2019; Maas, 2018). Proxy statements provide descriptive information about the structure of managerial compensation contracts (such as salary, bonus and stock-based compensation), including the performance measures utilized for performance-based compensation. Some companies only incorporate ESG-related compensation plans for their CEOs, while other companies deploy such plans for the whole board or even all senior managers within the company. Therefore, 'executive compensation' will be used as general terminology in this thesis. Advised by AMA Partners, an Amsterdam-based data analytics and intelligence agency specialized in ESG, a number of compensation-relevant search keywords have been identified. These keywords are complemented with keywords from Flammer et al. (2019) and Willis Towers Watson (2021). Ultimately, the score on ESG-related compensation has been formed by manually searching and summing up the number of keywords that appear in the proxy statements of S&P500 firms between 2010 and 2019. In some papers, like the article by Kriebel and Debener (2020), an additional measure is deployed in which they correct for the number of pages of the concerning document. Following the advice of the Erasmus Data Service Center (EDSC), there is no need to correct for the number of pages of the proxy statements, due to the specificness of the keywords. According to Matsuo and Ishizuka (2004), there can possibly be co-occurrence bias for frequent terms. From that point of view, it would make sense to correct for very common keywords, like 'compensation' or 'profit'. However, when the frequency of keywords is low the degree of biases of co-occurrence is unreliable (Matsuo & Ishizuka, 2004). It is important to note that a higher score proxies higher ESG-related compensation. Table 4 provides an overview of the used search keywords, broken down into Environmental, Social and Governance terms.

Table 4: Search keywords ESG-related compensation

Keywords	Category
Energy efficiency	Environmental
Energy reduction	Environmental
Environmental compliance	Environmental
Environmental goals	Environmental
Environmental performance	Environmental
Greenhouse gas emissions reductions	Environmental
Reduce carbon intensity	Environmental
Sustainability	Environmental
Waste reduction	Environmental
Community	Social
Compliance with ethical standards	Social
Diversity and inclusion	Social
Female representation	Social
Employee well-being	Social
Gender balance	Social
Health	Social
Product safety	Social
Reduced injury rates	Social
Safety	Social
Corporate social responsibility	Governance
Participation in sustainability index	Governance
Stakeholder engagement	Governance
Stakeholders	Governance

3.2.3. Moderating Variables

The effect of the independent on the dependent variable can be strengthened or weakened by a third variable, the moderator. In the case of this study, there are two moderating variables included in the regression model. First, a dummy variable indicating whether the maximum time horizon for a CEO to reach his or her full compensation is greater than one year (1) or equal to or less than one year (0), since LTIPs typically vest or measure performance for periods longer than one year (Grant Thornton, 2020). It is expected that when the compensation contract of a CEO is long-term (short-term) focused, the effect of ESG-related compensation will strengthen (weaken) the positive relationship between the independent and the dependent variable. The second moderating variable is the percentage of independent directors that have a seat in the non-executive board of a company (0-100%). Likewise, a higher (lower) percentage of independent board members is expected to strengthen (weaken) the positive relationship between the independent and the dependent variable. The dummy variable indicating long-term or short-term compensation was retrieved by transforming the continuous variable of the vesting period in years to a binary value. The percentage of independent board members was directly extracted from Datastream. It is important to note that the moderating variables will also be added to the regression models as control variables.

3.2.4. Control Variables

As the outcome variable in this study, financial firm performance as measured by ROA and Tobin's Q, is influenced by more factors than just the independent variable, a variety of control variables are employed. Previous literature has considered these control variables as potential contributors to financial firm performance. The applied control variables in this paper are firm size, leverage, firm age, revenue growth, industry fixed effects and year fixed effects. A more thorough description of the variables and the associated sign is provided below:

i. Firm size: a firm's size will be computed as the natural logarithm of total assets. Bigger companies can often more easily access funds to expand their operations and, therefore, eventually can generate larger profits (Astivasari & Siswanto, 2018). Following this reasoning, a positive relationship (+) between firm size and financial firm performance is expected.

ii. Leverage: by dividing total liabilities by total assets, the degree of a firm's leverage is controlled for. Following the pecking order theory, firms that are more profitable have more retained earnings to finance their investments and therefore need less debt financing. Moreover, according to Titman and Wessels (1988), profitable firms have relatively less debt relative to the market value of their equity. Hence, a negative relationship (-) is expected.

iii. Firm age: the age of a firm is, obviously, measured by subtracting the year of establishment from the concerning year in the dataset. There are a variety of arguments that can be used to explain the age-performance relationship. Pástor and Veronesi (2003), for instance, propose a risk argument that states investors' uncertainty lessens as the firm grows older, implying higher risk. Moreover, Knyazeva et al. (2013) document a negative relationship between age and both ROA and M/B. Therefore, a negative relationship (-) is expected.

iv. Revenue growth: added to control for differences in growth between firms and is measured by subtracting the operating revenue of the previous year from the operating revenue from the current year and dividing this number by the operating revenue of the previous year. Connoly and Hirshey (2005) argue that sales growth has a positive effect on market values and indeed find a significant positive relationship between sales growth and Tobin's Q. Moreover, Ramezani et al. (2002) find that sales growth positively affects multiple measures of profitability. For that reason, the relationship is expected to be positive (+).

v. Industry fixed effects: there are time-invariant differences between industries with respect to firm performance. Industry-level determinants of performance can be, amongst others, concentration, economies of scale, entry and exit barriers (Houthoofd & Hendrix, 2012). MacKay and Phillips (2005) find that a firm's variation in financial structure is determined by industry fixed effects for 13%. Moreover, McGahan and Porter (1997) argue that industry

effects account for almost 20% of a firm's ROA. Similarly, Wernerfelt and Montgomery (1988) find that industry effects are a major determinant of the variance in Tobin's Q. These findings highlight the importance of industries to companies' financial performance. Therefore, the 4-digit SIC code for each industry is incorporated into the dataset and are divided between the following overarching industries: Agriculture (0100-0999), Mining (1000-1499), Construction (1500-1799), Manufacturing (2000-3999), Transportation (4000-4999), Wholesale Trade (5000-5199), Retail Trade (5200-5999) and Services (7000-8999).

vi. Year fixed effects: to control for the annually varying economic factors and trends that impact financial firm performance, year-fixed effects are included into the model. Including year-fixed effects allows to eliminate bias from unobservables that change over time but are constant over entities, and potentially have effect on the measures ROA and Tobin's Q. For example, in periods of economic downturn (e.g., Global Financial Crisis) most of the companies will experience a decrease, or at least no increase, in financial firm performance. The effect of such crisis can be (partially) captured by implementing year fixed effects. Similarly, year fixed effects capture the cyclical pattern in macro variables, like the oil price today.

3.3. Descriptive Statistics

Table 5 provides the summary statistics of the variables. Significant outliers have been found for the variables ROA, Tobin's Q, ESG Compensation Score, Independent Board Members, Firm Age, Leverage Ratio and Revenue Growth. Therefore, these variables are winsorized at the 1st and 99th percentiles to minimize the impact of the outliers. It becomes clear from the table that for both financial firm performance measures (ROA and Tobin's Q) there is a significant standard deviation: .07 and 1.21, respectively. This means that there is substantial variation in the performance of S&P500 firms. The same holds for the ESG-related compensation score, which shows a standard deviation of 15.31 and an average of 16.18, implying substantial differences in ESG-related compensation between the companies in the sample. The Tobin's Q average (2.14) and median (1.75) show that the companies in the sample tend to be overvalued. The dummy variable indicating long-term or short-term compensation has a mean of .77, which indicates that 77% of the companies in the sample have a CEO compensation contract that matures over a period longer than one year. The variation in this dummy variable is high: 46%. Moreover, it becomes clear that the average of Independent Board Members is .84, which means 84% of the board consists of independent directors. When looking at Firm Age, it is visible that the average firm in the S&P500 between 2010-2019 is quite mature: 72 years on average. However, when considering the median the age drops to 61 years. Average and median revenue growth are 5% and 3%, respectively. It is also important to note that the size metric, Total Assets, is measured in US dollars, unadjusted and therefore the log is not displayed. Nevertheless, the log-adjusted Total Assets will be used in the regressions.

Appendix A (table 10) shows the descriptive statistics per industry subsample. It becomes clear that the Retail Trade industry reports the highest average ROA, namely 11.5%. Moreover, when looking at the market measure of performance, Tobin's Q, the Retail Trade industry also performs best with an average of 2.93. Zooming in on the score on ESG-related compensation per industry, the Mining industry appears to have the highest average score: 23.51. This is in line with the expectation that polluting sectors should show a higher score on ESG-related compensation. Among others, Yin et al. (2016) recognize the Mining industry as one of the most pollutive industries. The Transportation industry displays the second highest average score on ESG-related compensation (23.87), which is equally logical due to its polluting nature with air and sea freight being an important part of the sector. There is little difference in the average percentage of Independent Board Members across industries. The Wholesale Trade industry is the only one to show an average board independence below 80%. The industry with the, on average, youngest firms in the sample is the Services industry (58.9 years), while the Manufacturing industry accounts for the oldest companies with an average of 78.6 years. Leverage Ratio does not differ that much between industries, but the Transportation industry is the most debt-financed with an average ratio of 71.1%. Sectors with the highest and second highest average Total Assets in the sample are Transportation and Manufacturing, respectively. This is not surprising, since both industries are very capital intensive given the assets they need to buy (transportation vehicles and machinery) and the high cost of these assets.

Table 5: Summary statistics

Variables	Mean	Median	St. Dev.	Min	Max	N
ROA	.08	.07	.07	-.19	.27	3325
Tobin's Q	2.14	1.75	1.21	.85	7.31	3325
ESG Comp. Score	16.18	11.00	15.31	2.00	58.00	3325
Dummy LT. Compensation	.77	1	.46	0	1	3325
Independent Board Members	.84	.86	.09	.54	.94	3325
Firm Age	72.01	61.00	34.43	12.00	176.00	3325
Leverage Ratio	.61	.62	.20	.13	1.22	3325
Total Assets (unadjusted)	$2.73e^{10}$	$1.25e^{10}$	$4.57e^{10}$	$2.92e^{8}$	$5.52e^{11}$	3325
Revenue Growth	.05	.03	.12	-.78	.71	3325

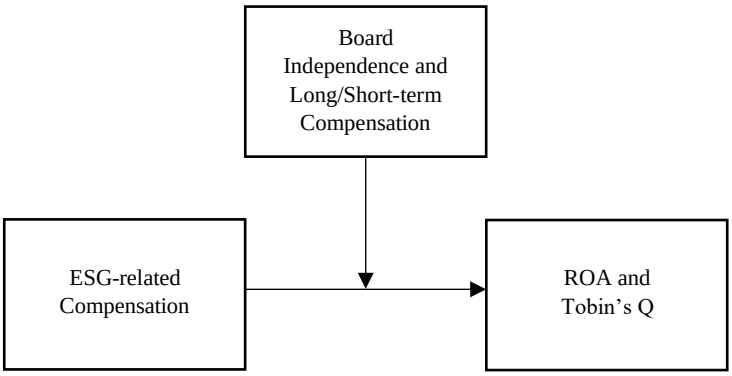
4. Methodology

This section covers the research methodology, regressions and robustness tests that are deployed to eventually attain the results that will answer the hypotheses of this paper.

4.1. Research Model and Regressions

Multiple OLS regressions will be used in order to test the effect of ESG-related compensation on financial firm performance. All the tests will be carried out by the statistical software STATA. As discussed earlier, two measures of financial firm performance will be used as dependent variable: the accounting measure ROA and the market measure Tobin's Q. The independent variable is a word count score on ESG-compensation indicators that is used as proxy for the extent to which firms deploy ESG-related executive compensation plans. Besides, two moderating variables are included in the research model to address potential interaction effects: the percentage of independent board members within a company and a dummy indicating whether the executive compensation plan is long-term (more than one year) or short-term (less than or equal to one year) focused. For the moderating analysis, the conceptual model by Memon et al. (2019) is followed. Figure 1 graphically shows this conceptual model. This model allows for specifications with interaction terms and the individual terms of the interaction terms, which makes it suitable for this study.

Figure 1: Conceptual model for moderating analysis



The moderating variable is connected to the dependent and independent variables by an arrow which points at the relationship between ESG-related Compensation and ROA/Tobin's Q. However, it is worth noting that the statistical visualization is different from the conceptualized model graphically as it includes an interaction term depicted by independent variable * moderating variable (Memon et al., 2019). To account for factors that affect ROA and Tobin's Q, a number of control variables are incorporated in the regression model, including firm-specific controls and industry and year fixed effects. Regressions (1a) and (1b) are deployed to test Hypothesis 1: *"Companies that have a higher ESG-related compensation score will have better financial firm performance".*

Testing Hypothesis 1 with ROA as measure of financial firm performance:

$$(1a)\ ROA_{i,t} = a_0 + \beta_1\ ESGCompScore_{i,t} + \beta_2 \ln(TotalAssets_{i,t}) + \beta_3\ FirmAge_{i,t} + \beta_4\ Leverage_{i,t} + \beta_5\ RevenueGrowth_{i,t} + \beta_6\ Year_t + \beta_7\ Industry_i + \varepsilon_{i,t}$$

Testing Hypothesis 1 with Tobin's Q as measure of financial firm performance:

$$(1b)\ TobinsQ_{i,t} = a_0 + \beta_1\ ESGCompScore_{i,t} + \beta_2 \ln(TotalAssets_{i,t}) + \beta_3\ FirmAge_{i,t} + \beta_4\ Leverage_{i,t} + \beta_5\ RevenueGrowth_{i,t} + \beta_6\ Year_t + \beta_7\ Industry_i + \varepsilon_{i,t}$$

The coefficient of interest for regressions (1a) and (1b) is β_1, on which a one-sided t-test will be performed.

To gain insight on whether long-term compensation moderates the effect ESG-related compensation on financial firm performance, regressions (2a) and (2b) are deployed. These regressions are ought to test Hypothesis 2a/2b: *"A long-term (short-term) time horizon to reach full compensation strengthens (weakens) the positive association between ESG-related compensation and financial firm performance"*. Therefore, the interaction term $(ESGCompScore_{i,t} * DummyLTComp_{i,t})$ is included.

Testing Hypothesis 2a/2b with ROA as measure of financial firm performance:

$$(2a)\ ROA_{i,t} = a_0 + \beta_1\ ESGCompScore_{i,t} + \beta_2\ DummyLTComp_{i,t} + \beta_3\ (ESGCompScore_{i,t} * DummyLTComp_{i,t}) + \beta_4 \ln(TotalAssets_{i,t}) + \beta_5\ FirmAge_{i,t} + \beta_6\ Leverage_{i,t} + \beta_7\ RevenueGrowth_{i,t} + \beta_8\ Year_t + \beta_9\ Industry_i + \varepsilon_{i,t}$$

Testing Hypothesis 2a/2b with Tobin's Q as measure of financial firm performance:

$$(2b)\ TobinsQ = a_0 + \beta_1\ ESGCompScore_{i,t} + \beta_2\ DummyLTComp_{i,t} + \beta_3\ (ESGCompScore_{i,t} * DummyLTComp_{i,t}) + \beta_4 \ln(TotalAssets_{i,t}) + \beta_5\ FirmAge_{i,t} + \beta_6\ Leverage_{i,t} + \beta_7\ RevenueGrowth_{i,t} + \beta_8\ Year_t + \beta_9\ Industry_i + \varepsilon_{i,t}$$

The coefficient of interest for regressions (2a) and (2b) is β_3, of which is the interaction term that may strengthen the positive effect of ESG-related compensation score on financial firm performance.

To test Hypothesis 3a/3b: *"A higher (lower) board independence strengthens (weakens) the positive association between ESG-related compensation and financial firm performance"*, regressions (3a) and (3b) include the interaction term $(ESGCompScore_{i,t} * BoardIndependence_{i,t})$. These regressions will assess

whether the percentage of independent board members within a company moderates the predicted effect in Hypothesis 1.

Testing Hypothesis 3a/3b with ROA as measure of financial firm performance:

$$(3a)\ ROA_{i,t} = a_0 + \beta_1\, ESGCompScore_{i,t} + \beta_2\, BoardIndependence_{i,t} + \beta_3\,(ESGCompScore_{i,t} * BoardIndependence_{i,t}) + \beta_4 \ln(TotalAssets_{i,t}) + \beta_5\, FirmAge_{i,t} + \beta_6\, Leverage_{i,t} + \beta_7\, RevenueGrowth_{i,t} + \beta_8\, Year_t + \beta_9\, Industry_i + \varepsilon_{i,t}$$

Testing Hypothesis 3a/3b with Tobin's Q as measure of financial firm performance:

$$(3b)\ TobinsQ_{i,t} = a_0 + \beta_1\, ESGCompScore_{i,t} + \beta_2\, BoardIndependence_{i,t} + \beta_3\,(ESGCompScore_{i,t} * BoardIndependence_{i,t}) + \beta_4 \ln(TotalAssets_{i,t}) + \beta_5\, FirmAge_{i,t} + \beta_6\, Leverage_{i,t} + \beta_7\, RevenueGrowth_{i,t} + \beta_8\, Year_t + \beta_9\, Industry_i + \varepsilon_{i,t}$$

The coefficient of interest for regressions (3a) and (3b) is β_3, which is the interaction term that may strengthen the positive effect of ESG-related compensation score on financial firm performance.

Finally, regressions (4a) and (4b) contain all the variables and the interaction factors with ROA and Tobin's Q as dependent variables, respectively:

$$(4a)\ ROA_{i,t} = a_0 + \beta_1\, ESGCompScore_{i,t} + \beta_2\, DummyLTComp_{i,t} + \beta_3\,(ESGCompScore_{i,t} * DummyLTComp_{i,t}) + \beta_4\, BoardIndependence_{i,t} + \beta_5\,(ESGCompScore_{i,t} * BoardIndependence_{i,t}) + \beta_6 \ln(TotalAssets_{i,t}) + \beta_7\, FirmAge_{i,t} + \beta_8\, Leverage_{i,t} + \beta_9\, RevenueGrowth_{i,t} + \beta_{10}\, Year_t + \beta_{11}\, Industry_i + \varepsilon_{i,t}$$

$$(4b)\ TobinsQ_{i,t} = a_0 + \beta_1\, ESGCompScore_{i,t} + \beta_2\, DummyLTComp_{i,t} + \beta_3\,(ESGCompScore_{i,t} * DummyLTComp_{i,t}) + \beta_4\, BoardIndependence_{i,t} + \beta_5\,(ESGCompScore_{i,t} * BoardIndependence_{i,t}) + \beta_6 \ln(TotalAssets_{i,t}) + \beta_7\, FirmAge_{i,t} + \beta_8\, Leverage_{i,t} + \beta_9\, RevenueGrowth_{i,t} + \beta_{10}\, Year_t + \beta_{11}\, Industry_i + \varepsilon_{i,t}$$

The coefficient of interest for regressions (4a) and (4b) is β_1, of which the effect may be strengthened or weakened by the inclusion of both interaction terms β_3 and β_5.

4.2. Additional Tests

4.2.1. Multicollinearity

For all variables, the Pearson correlation table is displayed in Appendix A (table 11). It is observable that the two measures for financial firm performance, ROA and Tobin's Q, are quite highly correlated:

52.3%. This can be declared by the fact that when firms make high returns, this will often be perceived by the market as a positive signal resulting in a higher Tobin's Q. Besides the correlation between the dependent variables, understanding the correlation between the independent variables is crucial since multicollinearity may be prevalent. Multicollinearity can pose issues with model fitting and result interpretation – hence explanatory variables should be independent of one another. According to Senaviratna and Cooray (2019), the general rule of thumb is that if correlation coefficient between two variables is greater than 0.8, multicollinearity is a serious problem. As observable in the table, there are no explanatory variables that exceed this border of correlation. For that reason, there can be assumed that multicollinearity is not an issue. Nevertheless, the variance inflation factor (VIF) will be used as a double check to rule out the possibility of multicollinearity. Craney and Surles (2002) suggest that a VIF of 5 or 10 is commonly used as cutoff value for significant multicollinearity concerns. Appendix A (table 12) provides an overview of the VIFs of the independent variables. It becomes clear that the VIFs of all independent variables are below 1.3, with an average of 1.10. This means that the variability of a certain independent variable explained by the remainder of the variables, is very low. In conclusion, multicollinearity is unlikely to be a problem given the Pearson correlation and the VIF evaluation.

4.2.2. Heteroskedasticity and Serial Correlation

In order to assess whether heteroskedasticity may be a problem, there will be tested for with the Breusch-Pagan test. Homoskedasticity, or homogeneity of variances, is an assumption of equal or similar variances within the different groups that are compared. Heteroskedasticity, the violation of this principle, can result in biased test results (Uyanto, 2022). The null hypothesis states that there is constant variability in random disturbance, that is homoskedasticity. Performing the Breusch-Pagan test on all independent variables with ROA as dependent variable, renders the following outcome: F-statistic = 10.71 and Probability > F = 0.000. This means the null hypothesis is rejected and heteroskedasticity is present at 1% significance. When executing the same test using Tobin's Q as dependent variable, this yields the following outcome: F-statistc = 17.76 and Probability > F = 0.000. Hence, conclusions are the same and heteroskedasticity is present at a 1% significance level. Robust standard errors will be deployed in the regression models in order to ensure unbiased standard errors. Next to the Breusch-Pagan test, the Breusch-Godfrey test will be executed to test for serial correlation. The null hypothesis of this test assumes no serial correlation. Performing the test on each regression model with both ROA and Tobin's Q as dependent variables, all Chi-squared values are significant at 1% (Probability > Chi2 = 0.000). Therefore, it can be concluded that the variables do suffer from autocorrelation. In order to solve this problem, clustered standard errors will be included in the regressions.

4.2.3. Omitted Variable Bias

When variables that have influence on the dependent variable are omitted from the regression model, omitted variable bias occurs. Omitted variable bias is one of the forms of endogeneity (Roberts & Whited, 2013). The deployment of fixed-effects models can partly repair this problem by controlling

for these non-included variables. However, there is a trade-off between the lower standard errors when using random-effects models alongside the less biased coefficients within the fixed-effects models (Williams, 2018). In order to make a choice between fixed- and random-effects models, a Hausman test will be performed. The null hypothesis of the Hausman test is the following: there is no correlation between the error term and the independent variables in the model and therefore the appropriate model is random effects. The alternative hypothesis is the following: there is significant correlation between the error term and independent variables and therefore the appropriate model is fixed effects (Sheytanova, 2004). Performing the Hausman test, it becomes clear that the null hypothesis is rejected, confirming the presence of endogeneity in the form of omitted variable bias in the independent variables. For that reason, fixed-effects models will be used in the regressions.

5. Empirical Results

This chapter discusses the empirical findings gathered through the execution of all aforementioned regressions. Besides, one-year lagged results will be reviewed and the simultaneity problem will be addressed as a robustness check.

5.1. Main Regression Results

5.1.1. The Effect of ESG-related Compensation on Financial Firm Performance

Table 6 provides the results of the regression on the association between ESG-related compensation and financial firm performance as measured by ROA (column 1a) and Tobin's Q (column 1b), over the period 2010-2019. Control variables and year and industry fixed effects are incorporated in both models. The explanatory power of each model can be derived from the adjusted R-squared. Model (1a) shows an R-squared of 0.1407, alongside 0.2282 in model (1b). From both model (1a) and (1b) it becomes clear that the coefficients of the main independent variable, ESG-related compensation score, positively affect ROA (0.0002) and Tobin's Q (0.0034) at a 5% significance level. The coefficient of ESG-related compensation score of 0.0002 in model (1a) denotes that when the score increases by 1, a firm's ROA increases by 0.02%. Simultaneously, the same coefficient in model (1b) 0.0034 denotes a 0.0034 increase in Tobin's Q when the score increases by 1. These results suggest that a higher ESG-related compensation score positively affects financial firm performance, hence confirming Hypothesis 1: *"Companies that have a higher ESG-related compensation score will have better financial firm performance".* When taking a look at the control variables with respect to ROA, the effects of Leverage Ratio (significantly negative), Firm Age (significantly negative) and Revenue Growth (significantly positive) are in line with the expectations. However, the coefficient of Log(Total Assets) is significantly negative, which is in contrast to the expected effect. A possible explanation for this negative effect could be that the more assets held by a firm, the lower its ROA due to the fact that total assets is the denominator of ROA, under the assumption of constant net income (Kartikasari & Merianti, 2016). Taking a closer look upon the control variables in model (1b), only the coefficient of the variable Leverage Ratio (significantly negative) matches the expectations. Again, the Log(Total Assets) is significantly negative. The variables Firm Age and Revenue Growth appear to have no significant effect on Tobin's Q, while being expected to show a negative and positive effect, respectively. An explanation for the insignificant coefficient of Revenue Growth may be that the variable possibly only drives value for smaller firms, and not for larger firms like in the S&P500 (Kodongo et al., 2015). The constants are both significant at 1%.

Table 6: Regression results ESG-related compensation and financial firm performance

Variables	(1a)	(1b)
	ROA	Tobin's Q
ESG Comp. Score	0.0002**	0.0034**
	(0.0001)	(0.0015)
Log(Total Assets)	-0.0039***	-0.3328***
	(0.0013)	(0.0216)
Leverage Ratio	-0.0697***	-0.2828**
	(0.0082)	(0.1389)
Firm Age	-0.0001**	0.0002
	(0.0000)	(0.0006)
Revenue Growth	0.0338***	0.2677
	(0.0118)	(0.1910)
Constant	0.1505***	8.8627***
	(0.0295)	(0.4806)
Observations	3325	3325
Adjusted R-squared	0.1407	0.2282
Year fixed effects	YES	YES
Industry fixed effects	YES	YES

Note: This table shows the results of the OLS regressions of the ESG-related compensation score on both ROA and Tobin's Q over the period 2010-2019. Log(Total Assets), Leverage Ratio, Firm Age and Revenue Growth are incorporated into the model to adjust for omitted variables. The regressions account for year-fixed effects and industry-fixed effects. The parentheses display the robust standard errors. *, **, and ***, respectively, represent the level of significance at the 10%, 5%, and 1% levels.

5.1.2. The Moderating Effects of Long-Term Compensation and Board Independence

Table 7 provides the results for the regressions including the moderating variables long-term compensation (a dummy indicating whether the CEO compensation plan matures in more or less than one year) and board independence (the percentage of independent board members within a company). The models also include the interaction terms of the moderating variables and the main independent variable, the score on ESG-related compensation. The same control variables as in models (1a) and (1b) are incorporated into the models, as well as the year and industry fixed effects. The adjusted R-squared shows the explanatory power of the models. The adjusted R-squared ranges from 0.1418 to 0.2382, meaning model (2b) has the highest explanatory power. However, comparing the adjusted R-squared of all the models, it becomes clear that they only slightly differ from each other.

Table 7: Regression results moderating effects of long-term compensation and board independence

Variables	(2a) ROA	(2b) Tobin's Q	(3a) ROA	(3b) Tobin's Q
ESG Comp. Score	0.0003**	0.0038**	0.0002**	0.0291*
	(0.0001)	(0.0016)	(0.0001)	(0.0166)
LT Comp. Dummy	0.0068*	0.2779***		
	(0.0036)	(0.0574)		
(ESG Comp. Score	0.0002	0.0005		
* LT Comp. Dummy)	(0.0002)	(0.0030)		
Board Independ.			0.0380**	0.6955**
			(0.0167)	(0.2748)
(ESG Comp. Score			0.0015	0.0296
* Board Independ.)			(0.0011)	(0.0187)
Log(Total Assets)	-0.0038***	-0.3280***	-0.0040***	-0.3349***
	(0.0013)	(0.0215)	(0.0013)	(0.0215)
Leverage Ratio	-0.0692***	-0.2470*	-0.0704***	-0.2954**
	(0.0083)	(0.1379)	(0.0083)	(0.1394)
Firm Age	-0.0001*	0.0003	-0.0001**	0.0001
	(0.0000)	(0.0005)	(0.0000)	(0.0005)
Revenue Growth	0.0337***	0.2465	0.0341***	0.2758
	(0.0118)	(0.1890)	(0.0118)	(0.1905)
Constant	0.1450***	8.6222***	0.1219***	8.3367***
	(0.0296)	(0.4806)	(0.0322)	(0.5312)
Observations	3325	3325	3325	3325
Adjusted R-squared	0.1418	0.2382	0.1421	0.2298
Year fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES

Note: This table shows the results of the OLS regressions of the ESG-related compensation score on both ROA and Tobin's Q over the period 2010-2019. The moderating variables LT Compensation Dummy, Board Independence and their interaction terms with ESG-related Compensation Score are included into the regressions. Log(Total Assets), Leverage Ratio, Firm Age and Revenue Growth are incorporated into the model to adjust for omitted variables. The regressions account for year-fixed effects and industry-fixed effects. The parentheses display the robust standard errors. *, **, and ***, respectively, represent the level of significance at the 10%, 5%, and 1% levels.

Models (2a) and (2b) include the moderating variable LT Compensation Dummy and its interaction term with the main independent variable. It becomes clear that the coefficient of the main independent variable is similar to, but slightly stronger than the coefficients in models (1a) and (1b). With respect to ROA, the coefficient of ESG-related compensation is 0.0003, indicating a 0.03% increase in ROA when the score increases by 1. The same coefficient in model (2b) is equal to 0.0038, indicating a 0.0038 increase in Tobin's Q when the ESG-related compensation score increases by 1. Both coefficients are statistically significant at a 5% level, again providing evidence for Hypothesis 1. The coefficient of the moderating variable LT Compensation Dummy is positively significant at a 10% level for ROA and at a 1% level for Tobin's Q, which is in line with the findings of Frydman and Jenter (2010). The interaction term (ESG Comp. Score * LT Comp. Dummy) shows a positive but statistically insignificant coefficient. Therefore, there is no evidence that long-term compensation positively moderates the effect of the ESG-related compensation score on ROA and Tobin's Q. Consequently, Hypothesis 2a/b: *"A long-term (short-term) time horizon to reach full compensation strengthens (weakens) the positive association between ESG-related compensation and financial firm performance"* is rejected. There are no major changes in the signs and significance of the control variables in models (2a) and (2b), compared to models (1a) and (1b). Models (3a) and (3b) shed light on the moderating variable Board Independence and its interaction term with the main independent variable. The coefficient of the variable ESG-related compensation (0.0002) in model (3a) as a 0.02% increase in ROA when the score increases by 1, significant at 5%. The effect of the same variable on Tobin's Q is 0.0291, equal to a 0.0291 increase in Tobin's Q when the score increases by 1. However, this effect is less significant than in the previous models, namely at 10%. Zooming in on the moderating variable Board Independence, it becomes clear that a higher Board Independence has a positive influence on both financial firm performance measures, at a significance level of 5%, confirming the findings of Knyazeva et al. (2013). The interaction variable (ESG Comp. Score * Board Independence) documents a positive and insignificant coefficient. This means there cannot be concluded that a higher Board Independence positively moderates the effect of the main independent variable on the two measures of financial firm performance. Hence, Hypothesis 3a/b: *"A higher (lower) board independence strengthens (weakens) the positive association between ESG-related compensation and financial firm performance"* is rejected. Again, there are no noteworthy changes in the sign and significance of the control variables compared to the previous regression models. All the coefficients of the constants are significant at 1%.

The combined effect of both moderating variables and their interaction terms on ROA and Tobin's Q is depicted in Table 8, including all variables in each model. The adjusted R-squared shows that the explanatory power increases slightly. Models (4a) and (4b) show a positive effect of ESG-related compensation score on the measures of financial firm performance, which is again in accordance with Hypothesis 1. However, the statistical significance of the coefficient in the ROA model drops to 10%, while remaining 5% in the Tobin's Q model.

Table 8: Regression results combined moderating effects of long-term compensation and board independence

Variables	(4a) ROA	(4b) Tobin's Q
ESG Comp. Score	0.0016*	0.0335**
	(0.0009)	(0.0167)
LT Comp. Dummy	0.0073**	0.2866***
	(0.0036)	(0.0575)
(ESG Comp. Score	0.0002	0.0007
* LT Comp. Dummy)	(0.0002)	(0.0031)
Board Independ.	0.0401***	0.7868***
	(0.0167)	(0.2724)
(ESG Comp. Score	0.0016	0.0342*
* Board Independ.)	(0.0011)	(0.0188)
Log(Total Assets)	-0.0039***	-0.3302***
	(0.0013)	(0.0214)
Leverage Ratio	-0.0699***	-0.2603**
	(0.0084)	(0.1383)
Firm Age	-0.0001**	0.0003
	(0.0000)	(0.0005)
Revenue Growth	0.0342***	0.2646
	(0.0118)	(0.1884)
Constant	0.1146***	8.0190***
	(0.0323)	(0.5308)
Observations	3325	3325
Adjusted R-squared	0.1433	0.2402
Year fixed effects	YES	YES
Industry fixed effects	YES	YES

Note: This table shows the results of the OLS regressions of the ESG-related compensation score on both ROA and Tobin's Q over the period 2010-2019. The moderating variables LT Compensation Dummy, Board Independence and their interaction terms with ESG-related Compensation Score are included into the regressions. Log(Total Assets), Leverage Ratio, Firm Age and Revenue Growth are incorporated into the model to adjust for omitted variables. The regressions account for year-fixed effects and industry-fixed effects. The parentheses display the robust standard errors. *, **, and ***, respectively, represent the level of significance at the 10%, 5%, and 1% levels.

In accordance with the previous models, the effect of the moderator long-term compensation dummy is statistically significant, but its interaction term is insignificant for both ROA and Tobin's Q. Therefore, Hypothesis 2a/b is not supported based on models (4a) and (4b). The moderating variable Board Independence has a positive effect on financial firm performance and is even more statistically significant at 1%. The interaction effect of Board Independence with ESG-related compensation score is again insignificant for ROA. Nevertheless, it becomes clear from model (4b) that the coefficient of the interaction term (0.0342) is positive and statistically significant at 10%. This coefficient should be interpreted together with the coefficient of the main independent variable, which is positive (0.0335) and statistically significant at 5%. Therefore, the combined effect is positive. This means that Hypothesis 3a/b is rejected for ROA and confirmed for Tobin's Q, based on models (4a) and (4b). No notable differences are observable in the sign and significance of the control variables in both models. The coefficients of the constants are again significant at 1%.

All in all, it is safe to say that the score on ESG-related compensation has a positive effect on financial firm performance as measured by ROA and Tobin's Q, since its coefficient is significant across all models. Hereby, Hypothesis 1 is confirmed. However, there is no significant effect found for the moderating effects of LT Compensation Dummy and Board Independence. This means Hypothesis 2a/b and Hypothesis 3a/b are rejected.

5.2. One-year Lagged Regression Results

The main regression results in section 5.1 provided ground for the first hypothesis: the ESG-related compensation score positively influences ROA as well as Tobin's Q. Besides, the moderating effects of long-term compensation and board independence did not significantly show up in the results, thereby rejecting the second and third hypothesis. However, it might be possible that the effects of ESG-related compensation, long-term compensation and board independence will become stronger or more apparent a year later. For example, Bear et al. (2010) argue that financial firm performance in the next year is determined by operations in the current year. Hence, all the main regressions will be executed with one-year lagged independent variables.

Taking a look at Appendix B table 13, the results with one-year lagged independent variables for the basic regression model are visible in columns (1a) and (1b). A small decrease in R-squared is visible, compared to the same model with non-lagged variables. The lagged value of ESG-related compensation score seems to remain positive and significant at 5% for Tobin's Q but loses some significance for ROA, decreasing to 10%. The lagged value of the control variable Revenue Growth in model (1b) is noteworthy, as the coefficient that was insignificant in the main regression, now appears to be significant at 1%. This confirms the aforementioned view of Bear et al. (2010). The lagged values of Total Assets and Leverage Ratio continue to be a good predictor of financial firm performance. There are no other outstanding differences in the sign and significance of the control variables. The one-year

lagged results for the regressions including the moderating effects are observable in Appendix B table 14. Apart from the fact that in model (2a) the main independent variable decreases in significance (10%), there are no remarkable changes. Contrary, model (2b) provides an interesting finding. The coefficient of ESG-related compensation score increases from 0.0038 to 0.0049 and becomes even more significant, at the 1% level. The lagged value of the main independent variable seems to be a better predictor of Tobin's Q, but a weaker predictor of ROA. Moreover, model (2b) shows a positively significant coefficient (0.0051) for the lagged interaction term of long-term compensation with ESG-related compensation score. Considering this effect together with the positive significant effect of ESG-related compensation score on Tobin's Q, it becomes clear that long-term compensation moderates the positive effect of the main independent variable on Tobin's Q in a one-year lagged context. Model (3a) reveals that the coefficient of ESG-related compensation score is positive and becomes stronger but less significant (10%), which means a higher relative standard error. Besides, the coefficient of the interaction term is positive but insignificant thus no one-year lagged moderating effect of Board Independence is found in model (3a). In model (3b), the coefficient of ESG-related compensation score increases from 0.0291 to 0.0349, as the significance level remains the same at 10%. With respect to the lagged interaction term of ESG-related compensation score and Board Independence, the coefficient is positive and becomes significant at 10%. This implies that the lagged value of Board Independence positively moderates the effect of ESG-related compensation score on Tobin's Q. Nevertheless, some caution is needed with drawing a hard conclusion since the level of statistical significance of both the main independent variable and the interaction term is only 10%. Besides the lagged value of Revenue Growth, which has a strong positive effect on Tobin's Q, there are no major changes in the control variables compared to the non-lagged models. Appendix B table 15 provides the results of the regressions including all lagged independent, interaction and control variables. The outcomes are similar to the outcomes in models (2a-3b) in table 14. The lagged effect of ESG-related compensation score on ROA does not differ from the non-lagged effect and is significant at 10%. Interaction terms in model (4a) are again insignificant. In contrast, the effect on Tobin's Q increases from 0.0335 to 0.0402 and remains significant at 5%. Moreover, both interaction terms are positive and significant at 10%. Considering these positive interaction terms alongside the increased positive effect of ESG-related compensation on Tobin's Q, this model indicates the variables LT Compensation Dummy and Board Independence to be positive moderators.

To conclude, the one-year lagged results prove that the effect of ESG-related compensation score on financial firm performance remains present. Yet, the significance of the effect on ROA is lower compared to the non-lagged models and there are still no moderating effects observable. The effect on Tobin's Q remains similar or even becomes stronger and LT Compensation Dummy and Board Independence appear to be positive moderators as their interaction terms become significant.

5.3. Robustness Check: Simultaneity

Simultaneity is one of the forms of endogeneity and occurs when not only the independent variable affects the dependent variable, but also the other way around. In previous literature on the relationship between ESG and financial firm performance, simultaneity has already been detected (Qureshi et al., 2021). Since this study is also related to ESG and financial firm performance – yet in the compensation context – it could be possible that there also is a bidirectional relationship present between ESG-related compensation score and ROA/Tobin's Q. Firms with a higher market-to-book value or profitability might be more induced to deploy ESG-related compensation contracts, because these companies have more funds to invest in ESG projects and they want to remain attractive for their investors. A common way to check for endogeneity in the form of simultaneity is by performing a Granger causality test. This test examines whether past values of *x* are significant predictors of the current value of *y*, and the inverse. The null hypothesis states that *x* has no causal influence on *y*. If the null hypothesis is rejected, there can be concluded that there exists causality from *x* to *y* (Lopez & Weber, 2017). Appendix B table 16 provides an overview of the results of the Granger causality test. It is important to note that the null hypothesis is rejected when the p-value is smaller than 0.05. As expected, the variable ESG-related compensation score has a causal effect on ROA, thus the null hypothesis is rejected with a p-value of 0.015. Moreover, the one-year lagged ROA also seems to Granger cause the current value of ESG-related compensation score (p-value = 0.041). This means simultaneity is present and there might endogeneity concerns in the regression models with ROA as dependent variable. Looking at the two remaining results in Appendix B table 16, it becomes clear that a causal relationship of ESG-relataed compensation on Tobin's Q is present. Therefore, the null hypothesis is rejected with a p-value of 0.026. Contrary to ROA, the lagged value of Tobin's Q does not seem to cause ESG-related compensation score (p-value = 0.055). Hence, it is unlikely that endogeneity is a problem within the Tobin's Q regression models. This result is similar to the finding by Orlitzky et al. (2003), stating that ESG has a higher causal effect on the accounting-based measures than the market-based measures of financial performance. The potential problem of endogeneity could be fixed by implementing instrumental variable analysis. An instrumental variable should have influence on the concerning independent variable, but not on the dependent. In practice, however, most instrumental variables that have effect on independent variables may also have an indirect effect on the outcomes variable and are therefore hard to find (Baser, 2009). Moreover, the standard errors of instrumental variable estimates are often larger than the standard errors of OLS estimates, creating a bias. Grootendorst (2007) argues that the instrumental variable estimator is unbiased when the sample size is at least 25,000 observations, which is far more than the observations in this study.

6. Conclusion and Discussion

This final section draws conclusions on the main results of this study. Besides, recommendations, the limitations of this study and suggestions for further research will be discussed.

This paper studied the following research question: *"What is the association between ESG-related executive compensation and financial firm performance?"*. This question was extended with the examination of two moderating variables: long-term compensation and board independence. In order to investigate this relationship, a sample of 3325 firm-year observations of companies in the S&P500 between 2010 and 2019 was utilized. Financial firm performance was measured by an accounting-based and a market-based measure of firm performance, ROA and Tobin's Q, respectively. This study is distinctive from other studies, because it measures the main independent variable (ESG-related compensation) by a score that was created by text mining: counting ESG-related compensation keywords in the proxy statements of the companies in the sample. Moreover, this paper is the first to dive deeper into the moderating effect of long-term compensation and board independence, on the relationship between ESG-related compensation score and financial firm performance. To limit the effect of omitted variables, there has been controlled for firm-specific factors as size, leverage, age and growth. Significant evidence is found that the self-constructed score has positive influence on both ROA and Tobin's Q. This finding holds across all regression models and the strength of the effect is quite similar for ROA and Tobin's Q. To examine the moderating effect of long-term compensation, a dummy variable indicating whether the time horizon for a CEO to reach full compensation is long-term (>1 year) or short-term (<1 year), was included as moderator. No significant moderating effect of long-term compensation was found, neither for ROA nor for Tobin's Q. The second moderator is board independence, measured as the percentage of independent members in the non-executive board of a company. Likewise, the results do not yield a significantly positive moderating effect of ESG-related compensation score on the two measures of financial firm performance. As a consequence, long-term compensation plans and a higher percentage of independent board members does not seem to strengthen the positive effect of the ESG-related compensation score on ROA and Tobin's Q.

Due to the fact that it might be possible that there is a delay in the effect of the main independent variable and the moderating effects on the dependent variable, all regression models were also run with one-year lagged independent variables. There can be concluded that the effect of ESG-related compensation score on financial firm performance remains present, although the significance of the effect on ROA seems to decrease somewhat. Long-term compensation and board independence still do not show a significant moderating effect on ROA. In contrast, the effect of ESG-related compensation score on Tobin's Q remains unchanged or even becomes stronger and more significant. The increase in strength can be partly attributed to the significant moderating effects of long-term compensation and board independence, which did not exhibit itself in the non-lagged regressions. Nevertheless, the

moderating effect is not extremely strong. A possible explanation for the fact that the moderating effects on Tobin's Q do show up one year later is that the percentage of independent board members and the compensation structure is published in the annual report at the end of the fiscal year. A high level of board independence and a long-term compensation structure can be perceived as a positive signal to investors. These investors make their investment decisions based on this delayed information, driving the market value of the company up one year later. Why would this effect not be observable when looking at the profitability measure ROA? Poor monitoring roles of independent directors could be an explanation, not ensuring ESG-related compensation plans to be effectively deployed and converted into profits.

From a practical perspective, this study provides insights that can be of use for multiple types of stakeholders such as the executive board of a firm, the non-executive board of a firm and investors. CSR sometimes requires large investments, but it is important to note that investments in CSR can lead to good CSP and even better financial firm performance. How should executive compensation incentives schemes be shaped? What governance mechanisms can be implemented in order to improve performance? These are questions that are important for executives and non-executives to consider. Based on the results, this paper advises companies to incorporate ESG-targets into their executive compensation plans, as these are likely to improve both profitability as market-to-book performance. Moreover, long-term incentive plans have a good chance to improve performance as well, but ESG-related compensation plans should not be entirely conditional upon the compensation time horizon. This might create some shareholder wealth but does not increase ROA, at least on the short run. It is far more important to include clear ESG-targets into remuneration schemes. Governance mechanisms like board independence are a good case, but it is very important for companies' boards to carefully choose these directors. Poor performing directors may fail to implement the right ESG-related compensation plans in order to improve a company's financial performance. With respect to investors, this study advises to take executive compensation plans and the degree its ESG-targets into consideration when making investment decisions, as this might improve their returns.

It is important to recognize the limitations of this paper and make several suggestions for further research. First of all, this study proxies for the degree in which companies incorporate ESG-related compensation plans by counting ESG-related compensation indicators is proxy statements. However, companies that *do* have sustainable incentives schemes but do not discuss this extensively in their proxy statements are underrated or maybe even left out the sample. Second, the variable indicating whether a company has long-term compensation plans is binary while the continuous value of the compensation horizon might pose a more nuanced view towards the design of incentive plans. Moreover, the firms in the dataset are all represented in the S&P500, which only makes the results robust for the largest, American companies. This study could have included firms from other sizes and regions, which is simultaneously the first suggestion for further research to make: an extension of this paper can examine

whether the results also hold for smaller, privately held firms in Europe or other parts of the world. Secondly, it would be interesting to investigate the effect of multiple-year lagged independent variables on ROA and Tobin's Q, as the moderating effects might become present or stronger over a longer time period. This would form the basis of a more comprehensive set of results and more trustworthy advice to the aforementioned stakeholders. Third, it would be interesting to investigate other variables as potential moderators of the effect of ESG-related compensation score on financial firm performance, like CEO tenure and CEO political preference. Lastly, in an extension of this paper it might be an idea to deconstruct the effect of ESG-related executive compensation into the pillars E, S and G, in order to assess whether these pillars have a different individual effect on financial firm performance.

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Appendix A

Table 9: Overview of variables

Variable	Type	Description
ROA	Dependent	Accounting measure of financial firm performance, measured as a firm's net income divided by its total assets.
Tobin's Q	Dependent	Market measure of financial firm performance, measured as the sum of the market value of equity and the book value of debt, divided by the book value of total assets.
ESG Compensation Score	Independent	Self-constructed score, based on counting ESG-related compensation keywords in the proxy statements of companies.
Long-term Compensation	Moderating	Dummy variable indicating whether the time horizon for the firm's executive to reach full compensation is longer than one year (1) or shorter than one year (0).
Board Independence	Moderating	Percentage of independent board members within the non-executive board of a company.
Total Assets	Control	Measured as the logarithm of a firm's total assets.
Leverage Ratio	Control	Measured as a company's total debt divided by its total assets.
Firm Age	Control	The number of years a company is active since its establishment.
Revenue Growth	Control	Measured as the difference between a firm's current year and last year operating revenue divided by a firm's last year operating revenue.
Industry FE	Control	SIC code indicating the company's industry.
Year FE	Control	Indicating the concerning year, varying between 2010 and 2019.

Table 10: Descriptive statistics per industry

Construction	Mean	Median	SD	Min	Max	N
ROA	.071	.071	0.056	-.123	.271	40
Tobin's Q	1.503	1.27	0.524	.879	2.777	40
ESG Comp. Score	12.278	12	6.567	3	26	40
LT Comp. Dummy	.639	1	0.487	0	1	40
Independent Board Members	.829	.845	0.098	.571	.938	40
Firm Age	67.333	72.5	19.475	33	93	40
Leverage Ratio	.538	.548	0.117	.298	.723	40
Total Assets	1.322e+10	1.118e+10	6268917331	4.760e+09	2.936e+10	40
Revenue Growth	.041	.034	0.154	-.605	.487	40
Manufacturing						
ROA	.083	.082	0.073	-.188	.271	1591
Tobin's Q	2.226	1.9	1.191	.85	7.314	1591
ESG Comp. Score	15.084	11	14.439	2	58	1591
LT Comp. Dummy	.691	1	0.462	0	1	1591
Independent Board Members	.846	.871	0.081	.539	.938	1591
Firm Age	78.586	77	35.680	12	176	1591
Leverage Ratio	.595	.589	0.200	.134	1.216	1591
Total Assets	2.748e+10	1.162e+10	4.684e+10	2.920e+08	3.753e+11	1591
Revenue Growth	.046	.028	0.118	-.785	.714	1591
Mining						
ROA	.017	.033	0.084	-.188	.176	217
Tobin's Q	1.425	1.343	0.457	.85	3.054	217
ESG Comp. Score	23.506	18.5	17.296	2	58	217
LT Comp. Dummy	.619	1	0.487	0	1	217
Independent Board Members	.842	.846	0.068	.636	.929	217
Firm Age	59.239	51	26.820	13	110	217
Leverage Ratio	.529	.523	0.121	.155	.882	217
Total Assets	1.723e+10	1.095e+10	1.491e+10	3.044e+09	7.796e+10	217
Revenue Growth	.03	.022	0.113	-.626	.391	217

Retail Trade						
ROA	.115	.099	0.075	-.157	.271	330
Tobin's Q	2.934	2.348	1.668	.85	7.314	330
ESG Comp. Score	14.934	8	16.150	2	58	330
LT Comp. Dummy	.687	1	0.465	0	1	330
Independent Board Members	.819	.833	0.096	.539	.938	330
Firm Age	68.986	59	37.855	16	176	330
Leverage Ratio	.605	.591	0.222	.134	1.216	330
Total Assets	1.803e+10	6.435e+09	3.240e+10	1.122e+09	2.252e+11	330
Revenue Growth	.053	.037	0.107	-.264	.521	330

Services						
ROA	.087	.083	0.064	-.188	.271	524
Tobin's Q	2.502	2.171	1.220	.85	7.314	524
ESG Comp. Score	9.361	7	8.289	2	58	524
LT Comp. Dummy	.611	1	0.488	0	1	524
Independent Board Members	.814	.833	0.104	.539	.938	524
Firm Age	58.918	54	26.548	12	120	524
Leverage Ratio	.611	.613	0.243	.134	1.216	524
Total Assets	2.404e+10	1.173e+10	3.856e+10	8.768e+08	2.752e+11	524
Revenue Growth	.056	.032	0.116	-.231	.697	524

Transportation						
ROA	.053	.041	0.045	-.158	.271	540
Tobin's Q	1.553	1.261	0.809	.85	6.745	540
ESG Comp. Score	23.866	21	17.746	2	58	540
LT Comp. Dummy	.849	1	0.358	0	1	540
Independent Board Members	.844	.875	0.093	.539	.938	540
Firm Age	73.163	76	32.859	12	137	540
Leverage Ratio	.711	.707	0.134	.229	1.216	540
Total Assets	4.117e+10	2.488e+10	6.104e+10	1.959e+09	5.517e+11	540
Revenue Growth	.044	.027	0.115	-.297	.562	540

Wholesale Trade						
ROA	.081	.079	0.035	.004	.188	83
Tobin's Q	1.971	1.891	0.529	1.303	4.12	83
ESG Comp. Score	9.411	7	8.401	2	47	83
LT Comp. Dummy	.768	1	0.426	0	1	83
Independent Board Members	.791	.8	0.073	.643	.933	83
Firm Age	71.268	49	43.769	35	176	83
Leverage Ratio	.645	.637	0.180	.237	1.216	83
Total Assets	1.633e+10	1.251e+10	1.481e+10	2.486e+09	6.097e+10	83
Revenue Growth	.038	.027	0.130	-.501	.647	83

Table 11: Pearson correlation table

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) ROA	1.000								
(2) Tobin's Q	0.523*	1.000							
(3) ESG Comp. Score	0.076*	0.114*	1.000						
(4) LT Comp. Dummy	0.025	0.035*	0.066*	1.000					
(5) Independent Board Members	0.005	0.011	0.228*	0.058*	1.000				
(6) Log(Total Assets)	-0.129*	-0.334*	0.403*	0.039*	0.148*	1.000			
(7) Leverage Ratio	-0.221*	-0.099*	0.153*	0.095*	0.102*	0.212*	1.000		
(8) Firm Age	-0.042*	-0.009	0.062*	0.069*	0.067*	0.066*	0.137*	1.000	
(9) Revenue Growth	0.066*	0.027	0.017	0.027	-0.002	0.019	0.006	0.001	1.000

*Note: Pairwise correlations including all variables. 5% significance is denoted by *.*

Table 12: Variance inflation factor

Variable	VIF	1/VIF
ESG Comp. Score	1.24	0.8036
Log(Total Assets)	1.23	0.8116
Leverage Ratio	1.08	0.9271
Board Independence	1.07	0.9378
Firm Age	1.03	0.9743
Revenue Growth	1.02	0.9805
LT Comp. Dummy	1.02	0.9834
Mean VIF	1.10	

Appendix B

Table 13: Lagged regression results ESG-related compensation and financial firm performance

Variables	(1a) ROA	(1b) Tobin's Q
Lag(ESG Comp. Score)	0.0001*	0.0032**
	(0.0000)	(0.0015)
Lag(Log(Total Assets))	-0.0058***	-0.2933***
	(0.0013)	(0.0212)
Lag(Leverage Ratio)	-0.0359***	-0.3342***
	(0.0075)	(0.1301)
Lag(Firm Age)	-0.0001**	0.0003
	(0.0000)	(0.0005)
Lag(Revenue Growth)	0.0469***	0.5038***
	(0.0112)	(0.1797)
Constant	0.1847***	8.1155***
	(0.0287)	(0.4789)
Observations	3324	3324
Adjusted R-squared	0.1215	0.2113
Year fixed effects	YES	YES
Industry fixed effects	YES	YES

Note: This table shows the results of the OLS regressions of the one-year lagged ESG-related compensation score on both ROA and Tobin's Q over the period 2010-2019. Lag(Log(Total Assets), Lag(Leverage Ratio), Lag(Firm Age) and Lag(Revenue Growth) are lagged (one-year) controls that are incorporated into the model to adjust for omitted variables. The regressions account for year-fixed effects and industry-fixed effects. The parentheses display the robust standard errors. *, **, and ***, respectively, represent the level of significance at the 10%, 5%, and 1% levels.

Table 14: Lagged regression results moderating effects of long-term compensation and board independence

Variables	(2a) ROA	(2b) Tobin's Q	(3a) ROA	(3b) Tobin's Q
Lag(ESG Comp. Score)	0.0002*	0.0049***	0.0015*	0.0349*
	(0.0001)	(0.0017)	(0.0008)	(0.0190)
Lag(LT Comp. Dummy)	0.0051	0.2817***		
	(0.0036)	(0.0591)		
Lag((ESG Comp. Score * LT Comp. Dummy))	0.0001	0.0051*		
	(0.0002)	(0.0029)		
Lag(Board Independ.)			0.0289*	0.6073**
			(0.0169)	(0.2798)
Lag((ESG Comp. Score * Board Independ.))			0.0016	0.0363*
			(0.0012)	(0.0213)
Lag(Log(Total Assets))	-0.0057***	-0.2883***	-0.0059***	-0.2947***
	(0.0013)	(0.0211)	(0.0013)	(0.0211)
Lag(Leverage Ratio)	-0.0354***	-0.3026**	-0.0363***	-0.3394***
	(0.0076)	(0.1296)	(0.0076)	(0.1298)
Lag(Firm Age)	-0.0001**	0.0005	-0.0001***	0.0002
	(0.0000)	(0.0005)	(0.0000)	(0.0006)
Lag(Revenue Growth)	0.0469***	0.5047***	-0.0473***	0.5125***
	(0.0111)	(0.1789)	(0.0112)	(0.1791)
Constant	0.1804***	7.8779***	0.1615***	7.6245***
	(0.0286)	(0.4792)	(0.0314)	(0.5369)
Observations	3324	3324	3324	3324
Adjusted R-squared	0.1221	0.2187	0.1223	0.2126
Year fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES

Note: This table shows the results of the OLS regressions of the one-year lagged ESG-related compensation score on both ROA and Tobin's Q over the period 2010-2019. The moderating variables Lag(LT Compensation Dummy), Lag(Board Independence) and their lagged (one-year) interaction terms with ESG-related Compensation Score are included into the regressions. Lag(Log(Total Assets)), Lag(Leverage Ratio), Lag(Firm Age) and Lag(Revenue Growth) are lagged (one-year) controls that are incorporated into the model to adjust for omitted variables. The regressions account for year-fixed effects and industry-fixed effects. The parentheses display the robust standard errors. *, **, and ***, respectively, represent the level of significance at the 10%, 5%, and 1% levels.

Table 15: Lagged regression results combined moderating effects of long-term compensation and board independence

Variables	(4a) ROA	(4b) Tobin's Q
Lag(ESG Comp. Score)	0.0016*	0.0402**
	(0.0009)	(0.0191)
Lag(LT Comp. Dummy)	0.0054	0.2890***
	(0.0036)	(0.0593)
Lag((ESG Comp. Score * LT Comp.	0.0001	0.0052*
Dummy))	(0.0002)	(0.0029)
Lag(Board Independ.)	0.0304*	0.6877**
	(0.0161)	(0.2771)
Lag((ESG Comp. Score * Board	0.0017	0.0402*
Independ.))	(0.0012)	(0.0213)
Lag(Log(Total Assets))	-0.0058***	-0.2898***
	(0.0013)	(0.0210)
Lag(Leverage Ratio)	-0.0357***	-0.3082**
	(0.0076)	(0.1293)
Lag(Firm Age)	-0.0001**	0.0004
	(0.0000)	(0.0005)
Lag(Revenue Growth)	0.0473***	0.5146***
	(0.0112)	0.1782
Constant	0.1558***	7.3175***
	(0.0313)	(0.5364)
Observations	3324	3324
Adjusted R-squared	0.1231	0.2204
Year fixed effects	YES	YES
Industry fixed effects	YES	YES

Note: This table shows the results of the OLS regressions of the one-year lagged ESG-related compensation score on both ROA and Tobin's Q over the period 2010-2019. The moderating variables Lag(LT Compensation Dummy), Lag(Board Independence) and their lagged (one year) interaction terms with ESG-related Compensation Score are included into the regressions. Lag(Log(Total Assets)), Lag(Leverage Ratio), Lag(Firm Age) and Lag(Revenue Growth) are lagged (one-year) controls that are incorporated into the model to adjust for omitted variables. The regressions account for year-fixed effects and industry-fixed effects. The parentheses display the robust standard errors. *, **, and ***, respectively, represent the level of significance at the 10%, 5%, and 1% levels.

Table 16: Results of the Granger causality test for simultaneity

Null hypothesis (H_0)	Observations	Chi-squared	P-value
ESG Comp. Score does not Granger cause ROA	3325	8.3669	0.015
ROA does not Granger cause ESG Comp. Score	3325	6.4031	0.041
ESG Comp. Score does not Granger cause Tobin's Q	3325	7.2823	0.026
Tobin's Q does not Granger cause ESG Comp. Score	3325	5.8173	0.055