



Lisbon School
of Economics
& Management
Universidade de Lisboa

MASTER
ACCOUNTING

MASTER'S FINAL WORK
DISSERTATION

**THE RELATIONSHIP BETWEEN SUSTAINABILITY COMPENSATION AND
FIRM PERFORMANCE: EVIDENCE FROM EUROPEAN FIRMS**

RICARDO MARQUES CUNHA

JUNE 2024



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SUPERVISION:

ISABEL SOFIA SANTOS DE ALBUQUERQUE

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*Para a minha família.
Obrigado por sempre
acreditarem em mim.*

GLOSSARY

- CFP – Corporate Financial Performance
- CSDDD – Corporate Sustainability Due Diligence Directive
- CSP – Corporate Sustainability Performance
- CSR – Corporate Social Responsibility.
- CSRD – Corporate Sustainability Reporting Directive
- EEA – European Environment Agency
- EU – European Union
- GDP – Gross Domestic Product
- GHG – Green House Gas
- IPCC – International Panel on Climate Change
- NFRD – Non-Financial Reporting Directive
- OLS – Ordinary Least Squares
- ROA – Return on Assets
- UN – United Nations

ABSTRACT

This research examines the relationship between Sustainability Compensation Incentives and firm performance in firms based in Europe. Using a sample of public European firms over the period of 2015 to 2021, it was investigated the extent to which Sustainability Compensation Incentives are related with firm performance, measured by the Return on Assets (ROA) of each firm.

The research employs an ordinary least squares (OLS) regression analysis to explore the relationship between Sustainability Compensation Incentives and firm performance, controlling for other manager compensation variables, corporate governance variables, CSR variables and firm-specific variables.

The findings indicate that Sustainability Compensation Incentives are not related to firm financial performance, as measured by Return on Assets.

The research has limitations, being the most important the fact that the independent variable, Sustainability Compensation Incentives is a binary variable, which does not allow to capture the nuances of sustainability compensation incentives.

KEYWORDS: Sustainability Compensation Incentives; Return on Assets, Firm Performance

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THE RELATIONSHIP BETWEEN SUSTAINABILITY COMPENSATION AND
FIRM PERFORMANCE: EVIDENCE FROM EUROPEAN FIRMS

By Ricardo Cunha

This research analyses the relationship between Sustainability Compensation Incentives and firm performance for public European firms between 2015 and 2021, using an OLS regression analysis. Findings suggest that the existence of Sustainability Compensation Incentives is linked to worse firm performance, as measured by ROA. This research provides further evidence on Sustainability Compensation Incentives and its relationship with firm performance.

1. INTRODUCTION

Climate change caused by human activities has become an urgent global concern, with significant implications for the Earth's ecosystems and the well-being of its inhabitants. The industrial revolution has led to the accelerated emission of Greenhouse Gases (GHGs), resulting in a rapid increase in global warming.

The consequences of this phenomenon are evident, as the average global temperature has risen by 1.1°C above pre-industrial levels in 2019, according to the European Commission. This warming trend continues to intensify, with a projected increase of 0.2°C per decade.

The escalating temperatures have triggered a range of detrimental effects, including the loss of sea ice, sea level rise, more frequent and severe heat waves, and disruptions to ecosystems. If these trends persist, estimates indicate a potential increase of 4.8°C in the average global temperature and a rise in sea levels exceeding 80cm by 2100.

Recognizing the urgency of the situation, the 2018 International Panel on Climate Change (IPCC) Report stressed the need to limit global warming to 1.5°C to mitigate the risks associated with climate change, as agreed upon in the Paris Agreement.

The impact of climate change extends beyond environmental concerns; it poses significant risks to the global economy. The World Economic Forum's Global Risks Report for 2023 identifies environmental risks, such as natural disasters, extreme weather events, and failure to adapt to climate change, as the most probable and impactful risks.

Looking ahead to the next decade, the report underscores the dominance of environmental risks, including biodiversity loss and ecosystem collapse, alongside ongoing challenges such as natural resource crises.

To combat these challenges and foster sustainable development, a transition towards a low-carbon and circular economy is essential. The United Nations has outlined the 2030 Agenda for Sustainable Development as a guiding framework for this transformation, emphasizing the need for inclusive and environmentally conscious economic growth. To accelerate progress, both the United Nations (UN) and the European Union (EU) have implemented various regulations, directives, plans, and agreements.

The Paris Agreement, adopted in 2015 by 196 parties at the UN Climate Change Conference (COP21), sets the objective of limiting global warming to below 2°C, ideally 1.5°C. In alignment with this global commitment, the European Commission introduced the European Green Deal in 2019. The European Green Deal aims to decouple economic growth from resource consumption, achieve zero net greenhouse gas emissions, and ensure a just transition for all regions and stakeholders.

While progress has been made through policy initiatives and regulations, limited research has specifically focused on sustainability compensation incentives. However, an extensive body of literature exists that demonstrates the relationship between manager compensation and firm performance, as well as a growing body of research exploring the link between sustainability/CSR and firm performance.

This master thesis seeks to address this research gap by examining the relationship between Sustainability Compensation Incentives and firm performance within the European context. By exploring European data, this study aims to provide insights into the effectiveness of managerial strategies in promoting sustainable practices and enhancing firm performance.

Thus, it is important to have a clear understanding of the concept of Sustainability and Corporate Social Responsibility (CSR). Due to the urgent need to protect the Earth's conditions for present and future generations, Sustainability has gained a lot of attention in business, academic research, and policy evaluation. It includes not only national and international economies, but also the deeds and obligations of organizations. In order to achieve sustainable development, businesses and governments must work together.

In order to understand Sustainability, one must first consult the Brundtland Report from 1987, which defined sustainable development as "development that meets present needs without compromising the ability of future generations to meet their own needs."

Nevertheless, despite a large body of research, Kuhlman & Farrington (2010) contend that more definition is needed for the concept of sustainability. Kuhlman & Farrington (2010) suggest making a distinction between the needs of the present, also known as well-being, and the needs of future generations, also known as sustainability, based on their research.

This division makes it possible to analyse scenarios and policy impacts more precisely, which clarifies the decisions that must be made. Sustainability is associated with the environmental dimension of the "triple bottom line," whereas well-being primarily relates to the social and economic dimensions.

CSR and manager incentives are becoming increasingly important for firms to consider when making business decisions. They consider the firm long-term strategy and impact on several domains. Sustainability Compensation Incentives are the natural outcome when combining both.

Sustainability Compensation Incentives are a variation of typical financial incentives. Sustainability-linked incentives are important as they show the firm commitment to its stated values and principles, they are used to mitigate climate-related risks, and they might help the firm with long-term value creation and resilience. If done properly they will include the firms' stakeholders' expectations and they will serve as a mechanism to improve reporting and transparency.

According to Cook et al., (2023), firms should determine which ESG indicators matter and the ones that do not matter. They argue that the reduction of greenhouse gas emissions (GHG) are on everyone's agenda, but its importance might differ from industry to industry.

For instance, financial services firms GHG emissions will have a limited impact, thus it is more impactful to reduce the emissions of their portfolios. Another example is given by Cook et al., (2023), the firm Tesco, includes food waste reduction on the incentives for their managers.

Different industries and different firms may develop different incentives system. Even for companies on the same industry the incentives can be designed differently because firms may want to achieve different goals than their competitors.

In summary, Sustainability Compensation Incentives might play a crucial role in fostering a corporate culture of sustainability, attracting, and retaining talent, managing risks, and positioning the firm for long-term success.

Hence, the underlying premise of this research is to explore how Sustainability Compensation Incentives are related to firm performance, for that, this research is divided into three main phases.

First, the literature review, where the relevant literature is analysed and the key concepts are explained, namely an insight into the importance of Corporate Social Responsibility and the role of firms in Sustainable Development.

Second, the sample of this research is presented and the research model is unveiled.

Lastly, the results of this research are shown. Conclusions, limitations, and future research recommendations are also explained.

2. LITERATURE REVIEW

2.1. The relevance of Sustainability

2.1.1. The Impacts of Climate Change

The modern economic models were developed in a world abundant with natural resources. However, the growth of market economies has led to exponential increases in human populations and per capita resource consumption (Daly & Farley, 2011).

Consequently, global Gross Domestic Product (GDP) has experienced exponential growth since 1950, resulting in both positive and negative effects. This exponential growth has also impacted the Earth's systems, leading to increased CO₂ emissions and global warming (Steffen et al., 2015).

The European Environment Agency (EEA) reported significant economic losses and fatalities due to weather- and climate-related events in Europe. Between 1980 and 2020, EEA member countries incurred total economic losses ranging from 450 to 520 billion euros (adjusted to the euro value in 2020). Meteorological and hydrological events accounted for 34% to 44% of these losses, while climatological events contributed to 22% to 24% of the total losses.

It is important to note that geotechnical hazards, such as earthquakes and volcanoes, were not included in these figures as they are not considered weather or climate-related events. Moreover, only a quarter to a third of these economic losses were insured. Heatwaves were responsible for most fatalities, with the heatwave of 2003 accounting for 50% to 75% of all fatalities resulting from weather and climate-related events in the last four decades.

2.1.2. The emergence of Sustainability and Corporate Social Responsibility

Sustainability has become a widely discussed concept in business, academic research, and policy appraisal due to the urgent need to preserve the Earth's conditions for current and future generations. It encompasses not only global and national economies but also the actions and responsibilities of organizations. Governments and firms play crucial roles in achieving sustainable development.

To grasp the concept of sustainability, it is essential to refer to the Brundtland Report of 1987, where sustainable development was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." However, Kuhlman & Farrington (2010) argue that despite a vast body of literature, the concept of sustainability requires further clarification.

According to their research, Kuhlman & Farrington (2010) propose distinguishing between the needs of the present, referred to as well-being, and the needs of future generations, referred to as sustainability. This division allows for a more precise analysis of scenarios and policy impacts, providing clarity on the choices that need to be made. Well-being primarily corresponds to the social and economic dimensions of the "triple bottom line," while sustainability aligns with the environmental dimension.

Over time, the notion of corporate social responsibility, or CSR, has changed, placing more and more focus on how business operations affect society and the environment. At first, corporate social responsibility (CSR) was mainly concerned with philanthropy and charity, whereby businesses would donate to social causes.

But as time went on, the concept of corporate social responsibility (CSR) grew to include a wider range of obligations, such as stakeholder engagement, environmental sustainability, and moral business conduct (Moir, 2001).

The connection between corporate operations and their effects on the environment and society is now more widely acknowledged. As a result, there are now frameworks and standards for CSR, and accountability and transparency are prioritized in CSR reporting (Moir, 2001).

2.1.3. Regulation to a Sustainable Development

Given the urgency and importance of sustainability, the international community, and the European Union (EU) have implemented various policies and regulations to promote sustainable practices and support climate-resilient firms. These policies and regulations are formulated not only by governments but also by international regulatory and supervisory agencies like the Financial Stability Board (FSB) and Central Boards and Supervisors.

The EU has prioritized the transition to a decarbonized and digital economy in the coming decades. This commitment is reflected in the European Union's multi-annual budget from 2021 to 2027 and the COVID-19 Next Generation EU recovery package. Additionally, the national recovery and resilience plans of European countries must allocate at least 37% of the budget to European sustainability objectives, ensuring that planned spending does not undermine these goals.

The European Green Deal, launched in 2020, serves as the EU's new growth strategy, outlining the policies and measures required to achieve carbon neutrality by 2050. The European Climate Law, which came into effect in 2021, legally binds the EU to its promise of carbon neutrality, providing predictability and transparency for European citizens, businesses, and investors. To support the transition to a sustainable economy, the EU has implemented the Sustainable Financing Strategy, which includes measures related to transition finance, inclusiveness, resilience, and the contribution of the financial system to global ambitions.

The EU has also introduced specific directives to enhance sustainable practices in the corporate sector. The Sustainable Finance Disclosure Regulation aims to reduce information asymmetries and combat greenwashing, redirecting capital flows to achieve sustainable and inclusive growth. The Corporate Sustainability Reporting Directive (CSRD), which replaced the National Financial Reporting Directive (NFRD), demands that sustainability reporting must be at the same level as financial reporting. Additionally, the EU Taxonomy provides an economic activity classification system that aligns with the EU's climate and environmental objectives.

To foster responsible and sustainable business behaviour throughout supply chains, the European Commission proposed the Corporate Sustainability Due Diligence Directive (CSDDD) in 2022. This directive obliges firms to identify, prevent, eliminate, or mitigate adverse impacts on human rights and the environment resulting from their activities, including issues like child labour, worker exploitation, pollution, and biodiversity loss.

2.2. Firms' role in Sustainable Development

2.2.1. Change of paradigm

The traditional assumption regarding firms' responsibility focused on maximizing shareholder wealth and prioritizing the interests of shareholders and stakeholders. However, over the past few decades, there has been a shift in firms' roles, extending beyond shareholder and stakeholder responsibilities. This expanded view of firms' obligations is encompassed by the concept of Corporate Social Responsibility.

Shareholder wealth maximization, as proposed by Friedman (1970), suggests that managers should conduct business in a manner that maximizes profits while adhering to societal rules and ethical customs. This principle emphasizes wealth maximization as the primary goal of firms, with higher share prices often linked to managerial remuneration.

However, this focus on short-term gains driven by shareholder wealth maximization can lead to a disregard for long-term shareholder and stakeholder interests, compromising the sustainability of the firm (Clarke & Friedman, 2016; Englander & Kaufman, 2004).

2.2.2. Agency Theory

The agency theory posits that managers act as agents representing shareholders' interests. Managers are expected to act in the best interests of shareholders without considering their self-interest (Eisenhardt, 1989).

The principal goal for shareholders is the maximization of firm value and performance, leading to the delegation of this task to managers (Jensen & Meckling, 1976). Compensating managers through various incentives, such as stock grants and options, can motivate them to perform their duties proficiently (Cullen & Kirwan, 2006).

However, this alone may not be sufficient to address agency problems and prevent opportunistic behaviour. Compensation programs should be designed to not only incentivize managers but also encourage the implementation of programs that enhance firm wealth and performance (Jensen & Meckling, 1976).

Managerial compensation should strike a balance between attracting competent directors and maintaining their independence, objectivity, and professional judgment (Magnan et al., 2010).

Furthermore, incentive programs should be objective, consider managerial talent, and align with the firm's principles, avoiding short-term objectives that may incentivize opportunistic behaviour conflicting with the firm's long-term goals (Pucheta-Martínez & Gallego-Álvarez, 2020).

Mahoney & Thorne (2005) found that there is a noteworthy relationship between long-term compensation strategies for their executives tend to exhibit stronger environmental initiatives.

2.2.3. *Sustainability and Manager Incentives*

Sustainability and manager incentives intersect in terms of long-term planning. While sustainability emphasizes long-term goals, manager incentive programs should also be designed with a focus on continuity and the long-term perspective.

Fatemi & Fooladi (2013) argue that the conventional approach of maximizing shareholder value is no longer viable for sustainable wealth creation. Firms have unintentionally externalized social and environmental costs due to the emphasis on short-term gains.

Unfavourable effects have come about because of relying only on markets to effectively expose the long-term value of short-term actions. These behaviours are not sustainable considering the urgent social and environmental issues.

Their study demonstrates the need to depart from the conventional strategy of externalizing social and environmental costs and emphasizing short-term shareholder rewards. It promotes the use of a framework for sustainable value creation that takes into consideration all societal and environmental effects of corporate operations.

Therefore, it is necessary for firms to transition from a short-term planning and pursue value creation on the long-term. As researched by Millon (2012), firms should put long-term sustainable growth and profits ahead of all other shareholder interests, i.e., transition from the shareholder model to an enlightened shareholder model.

To ensure firms adopt a long-term program that seeks sustainable growth and profits, it is crucial to align manager incentives with sustainability objectives. When incentive programs are designed for the long-term, firms are more likely to prioritize sustainable growth and profits over short-term wealth maximization.

2.3. Previous research on Managerial Incentives & CSR on Firms Performance

In the context of investigating the link between board compensation and firm performance, a comprehensive review of research conducted over the past two decades reveals a progressive trend in the management literature (Kartadjumena & Rodgers, 2019; Liu & Taylor, 2008; Noja et al., 2020; van Essen et al., 2015).

Corporate social responsibility studies are tightly entwined with research on the impact of sustainability on firm performance, making the two concepts frequently conceptually equivalent (Yilmaz, 2021). Given their close connection, the examination of prior literature includes both elements as relevant variables while forming this research project.

As was already noted, incentive programs are proving to be effective strategies for promoting sustainable growth and boosting long-term corporate success. The interaction between managerial incentives and corporate performance has thus drawn the attention of several academics (Conyon & He, 2011; Kartadjumena & Rodgers, 2019; Noja et al., 2020; Ruparelia & Njuguna, 2016).

The literature on the relationship between sustainability/CSR and company performance is characterized by a variety of conclusions.

A study by López et al. (2007) investigated the influence of CSR practices on business performance by analysing the relationship between CSR and accounting indicators among European firms. They found that there is evidence of a short-term negative impact on performance resulting from CSR adoption.

On the same note, Lee et al. (2009) researched the relationship between a firm's level of Corporate Sustainability Performance (CSP) and Corporate Financial Performance (CFP), they found that there is a negative association between CSP and CFP.

On the other hand, several authors reported a positive relationship between sustainability practices and firm performance.

Brammer & Millington (2008) examined the relationship between CSR and CFP. They found that firms with both remarkably high and exceptionally low CSP levels typically outperform other firms in terms of financial performance. Unexpectedly, firms

with noticeably bad social performance do best in the short term, whereas firms with excellent social performance do better over longer periods. This implies that various CSP profiles have varying long-term effects on financial success.

In their research, Artiach et al. (2010) explored the drivers behind high levels of CSP, focusing on the Dow Jones Sustainability World Index, they found that leading CSP firms tend to be significantly larger, experience higher growth and have a greater Return on Equity compared to other firms.

Wai & Cheung (2011) address the mixed findings in previous research regarding the relationship between CSR and financial performance, using data from top U.S. Green firms between 2009 and 2013, the study finds that CSR outcomes mediate the connection between CSR governance and financial performance. Whether companies effectively implement CSR governance to achieve positive CSR outcomes significantly influences their financial performance.

Abdelmotaal & Abdel-Kader (2016) investigated which firm characteristics influence the inclusion of sustainability incentives in executive remuneration contracts and whether these incentives affect shareholders' returns.

They found that the presence of a corporate sustainability committee, the independence of the compensation committee, the CSR sustainability index, and resource efficiency policy are all related to the adoption of sustainability incentives in executive compensation. There is also evidence that it has a favourable effect on shareholder returns.

In their research, Noja et al. (2020) examined the relationship between board and executive compensation and the financial performance of European firms within a sustainable development framework. They discovered that management financial incentives had a favourable and considerable impact on the performance of European firms.

Additionally, sustainability metrics including committee participation, policies, energy usage, and renewable energy sources have a beneficial impact on the financial success of the firms under study. Whereas the sustainability compensation incentives were not statistically significant. These findings highlight the possible advantages of matching managerial incentives with sustainability goals.

Given the previous research, it is noteworthy that the relationship between management incentives and firm performance is mainly positive (Conyon & He, 2011; Kartadjumena & Rodgers, 2019; Noja et al., 2020; Ruparelia & Njuguna, 2016). Additionally, the relationship between CSR/sustainability and firm performance is consistent with the results shown by management incentives, also being positively related (Kartadjumena & Rodgers, 2019; Noja et al., 2020; van Essen et al., 2015).

Taking into consideration the aforementioned and already researched, the present research proposes the following hypothesis:

Hypothesis 1: Sustainability Compensation Incentives have a positive relationship with Firm Performance.

3. SAMPLE AND METHODOLOGY

3.1. *Sample selection and data source*

As previously mentioned, the literature on Manager Incentives, CSR and Firm Performance is quite extensive. Previous research typically includes a sample from the United States of America (Conyon, 2006; López et al., 2007; van Essen et al., 2015; Vaupel et al., 2022) or specific industry (Handa, 2018; Javeed & Lefen, 2019; Kartadjumena & Rodgers, 2019).

There have already been some studies that use European firms, but the majority of them only focus on a single nation (Andreas et al., 2012; Branco & Rodrigues, 2008; Watson & Wilson, 2005), whereas there are only a few that look at the relationship between manager incentives in the context of CSR and firm performance (Noja et al., 2020). Additionally, there is no evidence of a study focusing on Sustainability Compensation Incentives relationship with firm performance, only Noja et al. (2020) used it as a dependent variable.

Having said that, this study will use a larger sample size that includes 23 countries. The study sample comprises publicly listed firms from Europe, including parts of Russia, during the period from 2015 to 2021. All the data was collected from the Eikon Datastream database.

For a country to be available to study, it was decided that they had to have at least 10 observations, which means that every country that had less than that amount had to be cut.

In the initial data cut, there was 12321 firms. For a firm to be available to study, it was necessary to eliminate every observation that had no values in one or more variables.

Observation that had strange values were also replaced from the sample in order not to skew the results. This process was done using winsorizing, where the smallest and largest value within the observations were replaced, this was done using a 1% winsorizing on both ends of the absolute value variables. Examples of this are extremely high or extremely negative values for Board Member Compensation and Senior Executive Compensation.

Given the aforementioned process, the final observations were 7642. More than half of those observations come from four countries. The United Kingdom comprises 28.83% of the total observations, 10.90% from Germany, 10.47% from Sweden and 10.14% from France. The countries that are eligible for this study are presented in Table I below:

TABLE I – OBSERVATIONS PER COUNTRY

Country of HQ	Freq.	Percent
Austria	134	1.75%
Belgium	188	2.46%
Denmark	226	2.96%
Finland	283	3.70%
France	775	10.14%
Germany	833	10.90%
Guernsey	15	0.20%
Iceland	13	0.17%
Ireland; Republic of	196	2.56%
Isle of Man	12	0.16%
Italy	269	3.52%
Jersey	28	0.37%

Luxembourg	76	0.99%
Malta	11	0.14%
Netherlands	314	4.11%
Norway	263	3.44%
Poland	130	1.70%
Portugal	54	0.71%
Russia	31	0.41%
Spain	193	2.53%
Sweden	800	10.47%
Switzerland	595	7.79%
United Kingdom	2203	28.83%
Total	7642	100.00%

3.2. Variables

Table II displays all the variables utilized in the research, classified by dependent variables, independent variables, and control variables, details the variables abbreviation which will be used for the rest of the research and shortly defines them:

TABLE II – DEFINITION AND CLASSIFICATION OF THE VARIABLES

Classification	Variable Name	Abbreviation	Definition
Dependent Variable	Return on Assets	ROA	This variable is calculated as the Income After Taxes divided by the Total Assets of the firm.
Independent Variables	Sustainability Compensation Incentives	SustInct	Dummy variable that is equal to one if the executive's compensation is linked to sustainability targets, 0 otherwise.
Control Variables	Board Member Compensation	BMemberComp	Total compensation of the board members in US dollars.

Total Senior Executive Compensation	SrExeComp	Total compensation paid to all senior executives as reported by the company.
Board Gender Diversity	BDiv	Percentage of females on the board.
Background and Skill	Back&Skills	Percentage of board members who have either an industry specific background or a strong financial background.
Independent Board Members	IndBMembers	Percentage of independent board members.
CSR Reporting	CSRReporting	Dummy variable that is equal to one if the firm has CSR reporting, 0 otherwise.
ESG Score	ESGScore	Overall firm score based on the self-reported information in the ESG pillars.
CSR Reporting Scope	CSRReportingScp	Percentage of the firm's activities covered in its CSR reporting.
Ln_Assets	LnAssets	Natural logarithm of total assets
Ln_Sales	LnSales	Natural logarithm of total sales

The dependent variable of this study is Return on Assets (ROA) emulating the studies from (Hamad & Cek, 2023; Ruparelia & Njuguna, 2016; Siminica et al., 2019; Yilmaz, 2021).

ROA is used to assess the efficiency of a firm in utilizing its assets to generate profits. A higher ROA suggests that the firm is better at generating income from its assets. It can be used to assess a firm's long-term financial performance, as a high or increasing ROA over time indicates that the company is effectively managing its assets to generate returns.

The independent variable of this research is the Sustainability Compensation Incentives, i.e., if the managers compensation is linked to sustainability targets or not. This variable is a binary variable, where 0 means that there are no sustainability targets

linked to the managers compensation and 1 means that there are sustainability targets linked to the managers compensation.

The remaining control variables can be divided into manager compensation variables, corporate governance variables and CSR variables.

For manager compensation, control variables such as Board Member Compensation, measured by the total compensation of board members in US dollars and Senior Executive Compensation, which is the total compensation paid to all senior executives as reported by the firm in its CSR report.

The corporate governance variables are Board Gender Diversity, which is the percentage of females on the board. Background and Skills, which is the percentage of board members who have either an industry specific background or a strong financial background. Lastly, the Independent Board Members, which is the percentage of independent board members as reported by the company in its CSR report. The corporate governance variable was chosen considering their importance for CSR matters and given that they are usually the most related to good governance.

As for the CSR variables, CSR Reporting is a binary variable ranging from 0 (the firm has no CSR Reporting) to 1 (the firm has CSR Reporting). CSR Reporting Scope, which is the percentage of the firm activities covered in the CSR reporting. These variables are considered fundamental as there is no legislation in Europe that demands companies to report all their CSR matters. Lastly, ESG Score, which is the Refinitiv ESG Score, an overall firm score based on the self-reported information in the environmental, social and governance pillars.

This research considers the control variables such as Ln_Assets and Ln_Sales as measure through the natural logarithm of total assets included to reflect the effect of the size of a firm (Noja et al., 2020; Yilmaz, 2021).

All the variables were retrieved from the Refinitiv Eikon Database for the seven complete years between 2015 and 2021, including the latter.

3.3. Methodology

To answer the question under research, Ordinary Least Squares (OLS) regressions are conducted.

The following model is constructed to determine the effects of sustainability compensation incentives on firm performance:

$$(1) ROA_{i,t} = \beta_0 + \beta_1 SustInct_i + \beta_2 BMemberComp_i + \beta_3 SrExeComp_i + \beta_4 BDiv_i + \beta_5 Back\&Skills_i + \beta_6 IndBMembers_i + \beta_7 CSRReporting_i + \beta_8 ESGScore_i + \beta_9 CSRReportingScp_i + \beta_{10} Ln_Assets_i + \beta_{11} Ln_Sales_i + \varepsilon_i$$

Standard errors in this regression analysis were not clustered.

4. RESULTS AND ANALYSIS

4.1. Descriptive statistics analysis

Table III below shows the descriptive statistical results for each variable. In the following section, the means, standard deviations, and minimum and maximum values of the variables used in this study are shown. In addition, it can be seen, that all variables utilized the 7642 data as previously mentioned.

TABLE III – DESCRIPTIVE STATISTIC ANALYSIS

Variable	Number	Mean	Std. Dev	Min	Max
ROA	7642	4.61	10.75	-91.89	236.78
SustInct	7642	0.355	0.479	0	1
BMemberComp	7642	1033708	995902.4	148407	3800000
SrExeComp	7642	8711218	9242776	884465	35000000
BDiv	7642	29.99	13.26	0	75
Back&Skills	7642	39.40	22.34	0	100
IndBMembers	7642	58.92	24.97	0	100
CSRReporting	7642	0.999	0.343	0	1
ESGScore	7642	58.45	17.54	8.09	96.06
CSRReportingScp	7642	92.82	18.40	0	100

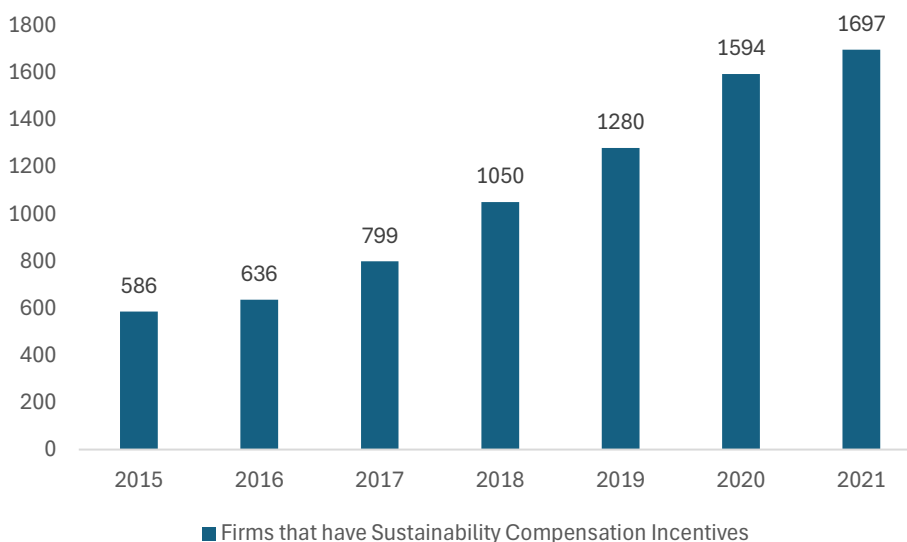
Ln_Assets	7642	22.00	1.67	19.11	25.18
Ln_Sales	7642	21.40	1.64	18.60	24.39

The mean value of the dependent variable, Return on Assets, was 4.61 with the minimum being -91.61 and the maximum being 236.78. This range of values means that there are firms that are not generating sufficient profits from its assets and some firms are generating more earnings than its total assets.

As for the independent variable, Sustainability Compensation Incentives, the mean was 0.355, with the minimum being 0 and the maximum being 1, as it is a binary variable. The mean suggests that most of the firms in this study do not have Sustainability Compensation Incentives.

The adoption of Sustainability Compensation Incentives has been progressive since 2015, as seen in Figure 1. In the period of 5 years the presence of Sustainability Compensation Incentives more than doubled in European firms.

Figure 1 - Firms that have Sustainability Compensation Incentives



This study examined senior executive compensation as well as total board member compensation for managers across a range of firms. The difference in these variables is due to this. It was looked at both bigger firms with senior executive remuneration of \$35000000000 USD and smaller firms with low board member compensation.

This research additionally examined at how some companies fail to consider gender equality in their board because they have 0% of women on the board and how some companies work to reduce inequalities by having 75% of their boards made up of women, with the average being close to a third (29.99%) of female board members.

Board-specific skills ranged from 0 to 100 percent, meaning that there are firms with all board members possessing industry specific background or a strong financial background and firms whose board members do not have any industry specific background or a strong financial background. On average firms have 39.40% of board members with industry specific background or a strong financial background.

The independence of board members was also examined as it is fundamental in the decision-making process. The independence of board members ranged from 0% to 100%, which means that there are firms that have no independent board members and firms where all board members are independent, on average, the examined firms have 58.92% of independent board members.

Another binary variable, CSR Reporting, ranges from 0 to 1, with 0 signifying no CSR reporting and 1 signifying CSR reporting for the firm. For the years 2015 to 2021, 0.999 firms on average report on their CSR activities.

As for ESG overall score, the mean value is 58.45, with a minimum value of 8.09 and a maximum value of 96.06. Meaning that the average ESG score for the sampled firms is considered good and exhibits a level of transparency in public reporting of significant ESG data that is above average.

As for CSR Reporting Scope, it represents the percentage of the firm activities covered in the CSR reporting. The maximum value of this variable was 100% and the minimum value was 0%, whereas the mean value was 92.82%, which means that firms are reporting all their CSR issues.

For both control variables, Ln_Assets and Ln_Sales, it was decided to control them by using their natural logarithms. Ln_Assets maximum was 25.18 and its minimum was 19.11, these variable averages a value of 22. Ln_Sales minimum value was 18.60 and its maximum value was 24.39, this variable averaged 21.40 percent.

4.2. Pearson correlation analysis

To assess the relationship between each variable in this research, whether it is the dependent variable, the independent variable, or the control variables, Table IV gives the results of the Pearson's Correlation Coefficient Analysis.

It is important to test the significant relationship between the variables, with values ranging from -1, which is negatively related, to 1, which would be positively related, to measure the strength and direction of the linear relationship between two variables at the same time.

TABLE IV – PEARSON'S CORRELATION COEFFICIENT ANALYSIS MATRIX

Variables	1	2	3	4	5	6
1 ROA	1					
2 SustInct	-0.0213*	1				
3 BMemberComp	-0.0082	0.0870***	1			
4 SrExeComp	0.0270**	0.1407***	0.5856***	1		
5 Bdiv	0.0282**	0.1600***	-0.0248**	0.0315***	1	
6 Back&Skills	0.0313***	0.0250**	0.0039	0.0702***	0.1575***	1
7 IndBMembers	0.0252**	0.0972***	0.1207***	0.1802***	0.1577***	0.0141
8 CSRReporting	0.0015	0.0255**	-0.0173	-0.0034	0.0126	-0.0183
9 ESGScore	0.0087	0.0070	-0.0423***	-0.0121	-0.0505***	0.1200***
10 CSRReportingScp	0.0027	0.2898***	0.4077***	0.3876***	0.03025***	-0.0970***
11 Ln_Assets	-0.0688**	0.1505***	0.5621***	0.5284***	0.1852***	-0.1099***
12 Ln_Sales	0.0164	0.1436***	0.5485***	0.5279***	0.1571***	-0.1375***

Variables	7	8	9	10	11	12
7 IndBMembers	1					
8 CSRReporting	-0.004	1				
9 ESGScore	0.0261**	0.0024	1			
10 CSRReportingScp	0.2811***	0.0326***	0.0558***	1		
11 Ln_Assets	0.1689***	0.0036	-0.0763***	0.6083***	1	
12 Ln_Sales	0.1239***	0.0039	0.0747***	0.5825***	0.8405***	1

Notes: *** p<0.01, ** p<0.05, * p<0.1

The table shows that SustInct and ROA have a Pearson correlation coefficient of -0.0213 (significant at the 10% level). This negative correlation suggests that ROA tends to decline as SustInct increases. The correlation is, however, not very strong.

Table V shows the Variance Inflation Factor (VIF) test carried out on the econometric model and validates that our model does not present any constraints regarding multicollinearity¹.

TABLE V – VARIANCE INFLATION FACTOR TEST

Variable	VIF	1/VIF
Ln_Assets	3.88	0.257776
Ln_Sales	3.71	0.269325
ESGScore	1.94	0.515639
BMemberComp	1.83	0.545157
SrExeComp	1.76	0.567561
Bdiv	1.18	0.848643
IndBMembers	1.12	0.896597
SustInct	1.11	0.9014
Back&Skills	1.08	0.922662
ESGReportingSep	1.02	0.97862
CSRReporting	1	0.997065
Mean VIF	1.79	

The VIF Test is meant to quantify the correlation and strength of the correlations occurring between explanatory variables in a regression model, making it particularly useful for identifying multicollinearity in econometric models.

By analysing the results of the VIF Test it is possible to conclude that there are no problems regarding multicollinearity since all variables have a VIF below five.

¹ Occurs when two or more explanatory variables are highly correlated to each other in a regression analysis. This can lead to a lack of accuracy in the result as these variables will not provide unique results.

4.3. Regression analysis

Table VI provides the results of the regression analysis conducted. The model tests the relationship between Sustainability Compensation Incentives and firm performance, measured as Return on Assets.

TABLE VI – REGRESSION ANALYSIS

VARIABLES	Model 1
SustInct	-0.005 (-0.003)
BMemberComp	0.000 (0.000)
SrExeComp	0.000*** (0.000)
BDiv	0.000*** (0.000)
Back&Skills	0.000*** (0.000)
IndBMembers	0.000*** (0.000)
CSRReporting	0.012 (-0.011)
ESGScore	0.000* (0.000)
CSRReportingScp	0.000 (0.000)
Ln_Assets	-0.030*** (-0.003)
Ln_Sales	0.021*** (-0.001)
Constant	0.203***

(-0.038)

Observations	7,642
R-squared	0.114

 Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The table shows that SustInct are not related to firm performance as the coefficient of SustInct is not statistically significant. Hence, H1 is not supported. Some control variables are statistically significant (e.g., SrExeComp, BDiv, Back&Skills, IndBMembers, ESGScore) but the coefficients are very small. The exception are Ln_Assets (coefficient of -0.03) and Ln_Sales (coefficient of +0.02). (

Several contextual factors that are missing in the model can explain the lack of statistical significance of SusInct. Firms that have aggressive compensation incentives related to sustainability, for instance, may prioritize longer-term sustainability goals ahead of short-term financial performance. This could result in initial investment costs that reduce return on assets (ROA) temporarily but could eventually lead to higher returns. Thus, the lack association observed in this study may reflect a temporal lag in realizing the benefits of sustainability initiatives rather than a fundamental detriment to financial performance.

Interpreting the relationship between SusInct and ROA becomes even more complex due to the importance of other control variables. The significance of governance quality and diversity in propelling firm performance is highlighted by the positive coefficients for board gender diversity (Bdiv), board member background and skills (Back&Skills), and the presence of independent board members (IndBMembers).

The lack of association between CSR reporting and ROA suggests the need for meaningful action and strategic alignment of sustainability initiatives with firm goals, as the mere disclosure of sustainability practices may not always result in better firm performance.

In conclusion, the analysis of SusInct offers interesting perspectives on how financial performance and sustainability incentives interact. The lack of statistical significance and the existence of confounding variables highlight the need for additional research to fully

understand the intricate relationships between sustainability, governance, and financial outcomes.

Subsequent research may utilize more extensive datasets and more advanced econometric methodologies to explain the complex relationships driving the sustainability-performance intersection in corporate environments.

5. CONCLUSIONS AND LIMITATIONS

The objective of this research was to analyse the relationship between Sustainability Compensation Incentives and firm performance, measured as Return on Assets, using a sample of 7642 observations. The source of the data for these variables was the Refinitiv Eikon Datastream, as well as for the other variables that were used.

Based on the research conducted, the findings are not as expected. Sustainability Compensation Incentives have a statistically significant relationship, but it is a negative one. The research shows that firms with Sustainability Compensation Incentives tend to have a lower ROA.

This was not an expected conclusion, given the existing literature. Previous research by Abdelmotaal & Abdel-Kader (2016) found that the inclusion of sustainability compensation incentives in executives' compensation had a positive impact on firm performance, as measured by shareholders' returns.

This research has several limitations. Future research can overcome these limitations. The first limitation is the geography of the study. CSR is a recent topic for firms, and its disclosure is not standardized across Europe, that is why the biggest frequency in this research sample is the United Kingdom and four countries compose more than 50% of the total sample.

Another limitation is the Sustainability Compensation Incentives measure in itself. The usage of a binary variable to measure the existence of incentives related to Sustainability does not allow to capture the nuances of sustainability compensation incentives. Therefore, the binary representation may oversimplify the reality and diminish the capacity to find statistically significant relationships.

The usage of ESG ratings as a variable is another limitation. The ratings utilized in this research were from Eikon Refinitiv Database, they range from 0 to 100. However, there are different rating agencies, some might use the same scale, but others might use a different scale or a different methodology to produce the ratings.

A further limitation is the data quality and availability. This can vary across firms, industries, and regions. A lack of data or inconsistencies in the data can limit the accuracy

of the results. Additionally, CSR data is self-reported by the companies, which can raise questions about its reliability.

Large firms will have to comply with the Corporate Sustainability Reporting Directive (CSRD) starting in 2024. The rest of the firms will then have to comply as well, and this limitation will no longer apply.

Another limitation is the lack of capacity to identify causal relationships between the variables. With the data available and the econometric models used it is not possible to establish a direct causal relationship between sustainability-linked compensation and firm performance.

Other factors such as industry dynamics, regulatory changes and market conditions may also influence firm performance as measured by Return on Assets.

Another limitation might be the period of this research. The research is based on the 6 years from 2015 to 2021, including the latter. However, most firms do not have values from the early years, which resulted in fewer observations.

Future research on the topic is necessary to obtain more complete answers. The econometric model utilized in this research only explains 3% of firm performance variance. Therefore, the inclusion of other variables related to firm performance may help improving the capacity of the model. Additionally, and given that as of 2024, the regulation on Sustainability, CSR and Sustainable Finance will be tightened and firms will be obliged to comply with it, there will be further opportunities to explore this issue.

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