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The Role of Sustainability Assurance in the Relationship Between Corporate Sustainability Performance and Corporate Financial Performance: A Comparative Study Between Nordic and Southwest EU Countries

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ABSTRACT

This thesis investigates how sustainability assurance (SA) and institutional context shape the relationship between corporate sustainability performance (CSP) and corporate financial performance (CFP) among European firms. Drawing on stakeholder, legitimacy, and institutional theories, the study examines whether external assurance enhances the credibility and financial relevance of sustainability reporting or merely serves as a symbolic signal of conformity. Using an unbalanced panel of 797 listed firms from six European countries, Denmark, Finland, Sweden, Italy, Spain, and Portugal, over the period 2009–2023, the analysis integrates financial, ESG, and institutional data from LSEG Workspace, BoardEx, and the World Bank. The models are estimated using two-way fixed effects (TWFE) regressions that control for unobserved firm and year heterogeneity. Results show that sustainability performance is weakly but positively associated with profitability, measured by Return on Assets, while market valuation (Tobin's Q) shows no consistent response. Contrary to theoretical expectations, external SA does not significantly moderate the CSP–CFP link, revealing what this thesis terms the “Green Assurance Paradox”: assurance increases visibility but not necessarily financial value. In contrast, institutional factors, particularly mandatory disclosure regimes under the EU Non-Financial Reporting Directive, significantly strengthen the CSP–CFP relationship, demonstrating that regulation and enforcement enhance the credibility of sustainability information more effectively than voluntary assurance. The findings suggest that the financial materiality of sustainability is institutionally embedded rather than firm-driven. For managers, investors, and policymakers, the results highlight that substance and regulation, rather than symbolism, determine whether sustainability creates measurable economic value.

Keywords: Corporate Sustainability Performance (CSP), Corporate Financial Performance (CFP), Sustainability Assurance (SA), ESG Disclosure, Mandatory vs. Voluntary Reporting, Big 4 Auditors, Panel Data Analysis, Stakeholder Theory, Institutional Theory, Legitimacy Theory, EU Comparison, Nordic Countries, Southwest Europe, Green Assurance Paradox, Corporate Sustainability Reporting Directive (CSRD)

1 Introduction

Over the past two decades, the concept of corporate success has evolved beyond the pursuit of financial profit. Firms are increasingly evaluated not only for their economic outcomes but also for their environmental and social impact. As the climate crisis deepens and inequalities widen, sustainable business has become not just a strategic choice but a societal necessity. Stakeholders, investors, and regulators now demand greater corporate accountability and transparency. This shift has made sustainability performance a central component of both corporate strategy and academic inquiry (Aftab et al., 2024; Coelho et al., 2023).

To demonstrate commitment to responsible business conduct, firms have increasingly adopted sustainability or ESG (environmental, social, and governance) reporting. However, the credibility of these reports has long been questioned. Disclosure practices remain largely voluntary, non-standardized, and vary substantially in quality across countries and industries (Boiral et al., 2019). The reliability of non-financial information therefore depends heavily on verification mechanisms. In response, a growing number of firms engage external parties to provide sustainability assurance, the independent verification of ESG data by accounting firms or specialized consultants (Braam & Peeters, 2018; Al-Shaer & Zaman, 2019). The expectation is that assurance enhances the credibility of sustainability information and, in turn, strengthens stakeholder trust and financial performance.

Yet the effectiveness of assurance is far from straightforward. While it is intended to increase transparency, some firms use assurance symbolically, aiming to signal conformity rather than to improve accountability (Boiral et al., 2019). This tension is conceptualized in this thesis as the “Green Assurance Paradox”: although assurance should, in theory, strengthen the link between sustainability performance and financial outcomes, in practice its impact often appears limited or inconsistent. Understanding whether sustainability assurance (SA) genuinely adds financial value or merely provides an appearance of credibility remains a central challenge in the sustainability–finance literature. This question lies at the heart of how businesses can contribute credibly to a more sustainable economy.

This issue has gained further importance in Europe’s shifting regulatory environment. The transition from the Non-Financial Reporting Directive (NFRD) to the Corporate Sustainability

Reporting Directive (CSRD) marks a significant institutional change, from largely voluntary disclosure to mandatory sustainability reporting and assurance. As these new rules reshape corporate accountability, they also provide a natural context for exploring how institutional frameworks affect the credibility and financial implications of sustainability disclosure. The present study situates itself within this transition, examining how assurance and regulation jointly influence the financial relevance of corporate sustainability performance.

Although the relationship between sustainability and financial performance has been studied extensively, the empirical evidence remains inconclusive. Numerous studies find a positive association between corporate sustainability performance (CSP) and corporate financial performance (CFP), suggesting that responsible firms benefit from enhanced efficiency, reduced risk, and reputational advantages. Other research, however, finds weak or even negative effects, often attributing inconsistencies to methodological differences, contextual factors, and variations in data quality (Coelho et al., 2023; Aydođan & Kara, 2023). A recurring theme across these studies is the credibility of sustainability information, how reliably stakeholders can trust reported ESG performance. SA has been proposed as a solution to this credibility gap, yet prior evidence on its financial consequences remains mixed and often limited to narrow contexts.

Existing studies also reveal several important gaps. Many treat assurance as a binary variable, ignoring qualitative dimensions such as provider type, scope, and coverage (Boiral et al., 2019; Braam & Peeters, 2018). Few have compared institutional contexts systematically, for instance between stakeholder-oriented regimes in Northern Europe and shareholder-oriented systems in Southern Europe. Even fewer have explicitly examined how mandatory disclosure frameworks, such as the NFRD, shape the credibility and financial effects of assurance. Most importantly, little is known about how assurance, institutional orientation, and disclosure regulation interact to influence financial outcomes within a unified analytical framework. Addressing these limitations is essential for understanding whether assurance acts as a substantive accountability mechanism or remains primarily symbolic.

This thesis aims to contribute to this debate by examining how SA and institutional context jointly shape the relationship between corporate sustainability performance and financial performance. Drawing on stakeholder, legitimacy, and institutional theories, the study

investigates whether assurance enhances the financial materiality of sustainability and under what conditions it does so. The empirical analysis focuses on publicly listed firms in six European countries, Denmark, Finland, Sweden, Italy, Spain, and Portugal, over the period 2009 to 2023, representing contrasting institutional models and regulatory developments. The study employs a longitudinal panel design with firm- and year-fixed effects to isolate within-firm changes over time, ensuring robust inference on the dynamic interplay between sustainability practices and financial outcomes.

Theoretically, this thesis integrates three complementary perspectives. Stakeholder theory (Freeman, 1984) provides a foundation for expecting positive links between CSP and CFP, arguing that responsible firms gain competitive advantages by managing stakeholder relationships effectively. Legitimacy theory offers a lens for understanding the symbolic use of assurance: firms may adopt it primarily to maintain or restore legitimacy rather than to improve transparency (Boiral et al., 2019). Institutional theory (DiMaggio & Powell, 1983) helps explain how national systems, regulatory frameworks, and cultural norms shape organizational behavior, leading to distinct assurance practices across contexts. Together, these perspectives highlight that sustainability outcomes depend not only on firm-level intentions but also on institutional structures that determine whether assurance practices are substantive or symbolic.

Beyond its theoretical contribution, this study offers practical relevance for managers, investors, policymakers, and assurance providers. For corporate managers, it clarifies whether engaging in SA yields tangible financial benefits or primarily reputational gains. For investors, it offers evidence on when assured ESG information can be trusted as a reliable indicator of firm value. Policymakers may use the results to evaluate the effectiveness of mandatory disclosure frameworks such as the CSRD in promoting transparency and accountability. For assurance providers, the findings highlight the importance of methodological rigor and independence to ensure that assurance enhances credibility rather than serves as symbolic compliance. Ultimately, by exploring how credibility, regulation, and value creation intersect, this research contributes to the broader question of how business can move from reporting sustainability to delivering it.

The remainder of this thesis is structured as follows. Chapter 2 reviews the theoretical foundations and prior empirical literature on sustainability performance, assurance, and

institutional context, developing the study's hypotheses. Chapter 3 presents the research design, data, and methodology, including the variables, econometric model, and robustness checks. Chapter 4 reports and interprets the empirical results. Chapter 5 discusses the implications of these findings for theory and practice, and Chapter 6 concludes by summarizing the study's main contributions, limitations, and suggestions for future research.

2 Theoretical Framework and Literature Review

2.1 Institutional Framework

In recent decades, the purpose of corporate reporting has evolved beyond the communication of financial outcomes to include the environmental and social impacts of business activities. As stakeholder expectations broadened, the need for credible sustainability information became central to both market valuation and public trust (García-Sánchez et al., 2019; Boiral et al., 2019). Companies now face the dual challenge of demonstrating financial competence while proving their commitment to sustainable value creation. This chapter explores how CSP interacts with CFP under varying institutional settings and how SA functions as a credibility mechanism within that relationship.

The rise of sustainability reporting across Europe is both a regulatory and normative phenomenon. Regulatory developments such as the EU Non-Financial Reporting Directive (NFRD) have gradually transformed voluntary corporate social responsibility (CSR) reporting into structured sustainability disclosure. According to Krasodomska et al. (2024), the NFRD marked a turning point: it shifted the focus from discretionary sustainability communication toward standardized, mandatory frameworks. Yet, even within the EU, significant variation persists in how firms interpret, implement, and verify sustainability disclosures. In Nordic countries, strong social-democratic traditions and stakeholder-oriented governance models foster substantive reporting and external assurance. In contrast, firms in Southern and Southwestern Europe tend to approach sustainability through a shareholder-value lens, often emphasizing compliance and legitimacy rather than deep integration (Braam & Peeters, 2018; Jackson & Apostolakou, 2010).

The resulting disparity creates an ideal context for examining how institutional conditions shape the financial relevance of sustainability. In theory, sustainability performance contributes to firm value by mitigating risks, improving stakeholder relations, and enhancing long-term efficiency (Freeman, 1984). In practice, however, its financial benefits depend heavily on whether stakeholders perceive the information as credible and comparable across firms. Here, SA plays a potentially pivotal role: it aims to reduce information asymmetry and provide external validation for non-financial claims (Boiral et al., 2019). Nevertheless, the assurance market remains fragmented, with varying providers, standards, and scopes. Studies by Larrinaga et al. (2020) and Ruiz-Barbadillo and Martínez-Ferrero (2020) show that the absence of uniform assurance regulations results in divergent practices across countries, sometimes blurring the line between symbolic and substantive assurance.

Thus, institutional theory offers a useful lens to understand how these national systems affect assurance adoption and impact. In stakeholder-oriented settings, institutional norms and social expectations encourage transparency, making assurance a natural extension of accountability. In shareholder-oriented contexts, however, legitimacy theory suggests that firms may adopt assurance primarily as a reputational tool, signaling conformity rather than demonstrating substantive commitment (Boiral et al., 2019). Both theories intersect with stakeholder theory in explaining not only why firms invest in sustainability, but also how they communicate it.

This interplay between institutional pressures, assurance practices, and financial performance forms the foundation of this study. By integrating these theoretical perspectives, the next sections explore how corporate sustainability can enhance financial outcomes and under what institutional and assurance conditions these effects are most likely to materialize.

2.2 Theoretical Background

2.2.1 Stakeholder Theory

Stakeholder theory provides the first theoretical pillar for linking sustainability and financial performance. According to Freeman (1984), firms are not merely profit-maximizing entities but social institutions that depend on the trust and cooperation of multiple stakeholders. Effective

management of stakeholder relationships, employees, customers, suppliers, investors, and communities, creates long-term value and reduces conflict costs. Firms that invest in sustainability initiatives can enhance stakeholder satisfaction, attract and retain skilled employees, improve customer loyalty, and secure favorable financing conditions (Aftab et al., 2024; Licandro et al., 2024).

From a financial standpoint, such trust translates into risk mitigation and stable cash flows. Sustainability performance becomes a strategic resource: it strengthens reputation, facilitates market access, and shields the firm from regulatory shocks. Empirical studies support this reasoning. For example, Coelho et al. (2023) find that companies with higher ESG performance often experience superior financial outcomes due to improved stakeholder engagement. Similarly, Vargas-Santander et al. (2023) demonstrate that firms operating in countries with high sustainability norms benefit from stronger financial returns, reinforcing the notion that stakeholder trust has tangible economic value.

These benefits operate through multiple channels. First, strong CSP can improve employee morale, productivity, and retention, thereby reducing human capital costs. Second, it can enhance customer loyalty and brand reputation, potentially commanding price premiums or expanding market share. Third, it can facilitate access to capital by reducing perceived risk among investors and lenders (Carey et al., 2021). However, stakeholder theory also highlights a fundamental information asymmetry problem. Stakeholders must rely on firms' self-reported sustainability disclosures to assess CSP, creating opportunities for impression management and greenwashing (Cho et al., 2012). This information credibility gap provides the theoretical rationale for third-party sustainability assurance.

2.2.2 Institutional Theory

While stakeholder theory explains why sustainability creates value, institutional theory (DiMaggio & Powell, 1983) explains why this relationship differs across contexts. Organizations are embedded in institutional environments characterized by formal rules, professional norms, and social expectations. These institutions shape corporate behaviour through coercive (regulatory), normative (professional), and mimetic (imitative) pressures. In countries with strong

institutions and stakeholder-oriented cultures, such as the Nordic economies, these pressures encourage substantive integration of sustainability into corporate strategy. Firms face institutional expectations not only to report but also to perform (Gjølberg, 2009), while external assurance serves as a credibility mechanism that signals transparency and accountability to stakeholders (Braam & Peeters, 2018).

Conversely, in shareholder-oriented regimes like those in Southern Europe, institutional incentives differ. The regulatory focus tends to prioritize shareholder value and financial returns, often resulting in symbolic or minimal compliance with sustainability norms. Firms may adopt SA for appearance rather than substance, echoing the "decoupling" phenomenon described in institutional theory, where formal structures exist but practices remain disconnected from actual performance (Larrinaga et al., 2020; Boiral et al., 2019). As a result, assurance in such contexts may have limited credibility or financial relevance.

The institutional context is particularly relevant for understanding cross-country variation in CSP practices and their financial implications. Nordic countries are characterized by coordinated market economies, strong labor unions, comprehensive welfare states, and deeply embedded norms of corporate social responsibility. These informal institutions create strong expectations for substantive sustainability engagement, and firms that fail to meet these expectations may face significant reputational penalties (Aibar-Guzmán et al., 2024). This institutional heterogeneity suggests that the moderating effect of assurance on the CSP-CFP relationship may vary systematically across regions.

2.2.3 Legitimacy Theory

Legitimacy theory adds a third dimension, explaining the motives behind assurance adoption. It suggests that firms seek legitimacy, the perception of their activities as desirable and appropriate within socially constructed systems of norms and values (Suchman, 1995). When public trust is at stake, companies use sustainability reporting and assurance as strategic tools to manage legitimacy gaps. For firms with strong performance, assurance confirms authenticity; for those with weaker performance, it offers symbolic legitimacy. This dual nature creates the "Green Assurance Paradox": a mechanism designed to enhance credibility can also be used superficially.

In voluntary disclosure regimes, the legitimacy motive often dominates. Firms choose selective assurance, limited scope, non-Big 4 providers, or partial coverage, to signal compliance at minimal cost (Manetti & Becatti, 2009). In mandatory regimes, however, regulatory oversight constrains such behavior. The emerging CSRD framework, for instance, is expected to harmonize assurance practices and reduce symbolic adoption (Krasodomska et al., 2024).

Taken together, stakeholder, institutional, and legitimacy theories explain what, why, and under what conditions sustainability performance affects firm value. Stakeholder theory emphasizes the potential for sustainability to create economic value through stakeholder trust and resource efficiency. Institutional theory explains how national systems, regulatory frameworks, and cultural norms shape the incentives for firms to engage substantively or symbolically in sustainability. Legitimacy theory clarifies why firms may pursue assurance to maintain social approval, even when underlying practices differ in substance. This integrated framework connects firm-level strategy with institutional context and forms the theoretical foundation for the hypotheses tested in this study.

2.3 Literature Review

2.3.1 The Relationship between Sustainability Performance and Financial Performance

The relationship between corporate sustainability performance and corporate financial performance has long intrigued scholars, but results have varied across time and context. Early studies often reported mixed findings, some positive, others neutral or even negative, depending on methodological choices and data quality (Aydoğan & Kara, 2023; Robles-Elorza et al., 2023). More recent research, however, leans toward a positive association. Friede et al. (2015) conducted a comprehensive meta-analysis of over 2,000 studies and found that approximately 90% of studies reported a non-negative relationship, with roughly half documenting statistically significant positive effects. This consensus has strengthened in recent years, particularly in contexts where sustainability information is credible and comparable (Rahi et al., 2024; Vargas-Santander et al., 2023).

Coelho et al. (2023) identify several mechanisms through which CSP may enhance CFP: improved operational efficiency, lower cost of capital, enhanced reputation, and greater employee engagement. These benefits materialize through stakeholder trust and long-term strategic positioning rather than short-term financial gains. Yet, as Reverte (2021) notes, markets respond only when sustainability data are credible and relevant to investors. Without credible verification, even genuine improvements may fail to translate into financial value.

An emerging body of research examines whether the CSP-CFP relationship has strengthened over time as sustainability has become more salient to investors and stakeholders. Sabirali and Mahalakshmi (2023) suggest that the financial materiality of CSP has increased in recent years due to growing ESG investment flows, enhanced disclosure requirements, and heightened stakeholder activism. This temporal strengthening could reflect the maturation of sustainability as a mainstream business concern rather than a peripheral issue. However, the inconsistency in findings across studies has been attributed to measurement differences, methodological choices, sample characteristics, and temporal dynamics, underscoring the need for rigorous empirical approaches that account for contextual variation.

2.3.2 Sustainability Assurance: Function and Quality

SA has emerged as a critical mechanism for enhancing the credibility of corporate sustainability reporting. Junior et al. (2014) trace the historical development of assurance practices, documenting steady growth in adoption since the early 2000s, though significant variation persists across countries and sectors. The primary function of assurance is to provide independent verification of sustainability information, thereby reducing information asymmetry between firms and stakeholders and enhancing the reliability of disclosed data.

Empirical evidence suggests that assurance adoption is associated with improved reporting quality and stakeholder confidence. García-Sánchez et al. (2019) found that firms with assured sustainability reports enjoy better access to finance, lower cost of capital, and improved analyst coverage, indicating that capital markets value assurance as a credibility signal. Reverte (2021) examined the Spanish stock market and found that voluntary assurance adoption is associated with positive abnormal returns, suggesting that investors view assurance favorably. Cheng et al.

(2015) used an experimental design to study investor decision-making and found that assurance of strategically relevant sustainability indicators increases investor confidence and willingness to invest, particularly when provided by reputable assurance providers.

However, not all assurance is equal. Assurance quality varies along multiple dimensions that may differentially affect credibility and value. Three dimensions are particularly salient in the literature and in this study.

First, provider type distinguishes between professional accountancy firms (particularly Big 4 firms) and specialized sustainability consultants. Big 4 firms bring audit expertise, established quality control systems, and substantial reputational capital, potentially enhancing assurance credibility (Al-Shaer & Zaman, 2019). However, they may lack deep sustainability expertise and face potential conflicts of interest when providing both assurance and consulting services. Specialized consultants offer technical sustainability knowledge but may have weaker quality control infrastructure and less reputational capital at stake. Empirical evidence on provider type effects is mixed, with some studies finding Big 4 premiums and others detecting no significant differences.

Second, assurance level refers to the rigor of verification procedures. Reasonable assurance (the highest level) involves extensive evidence gathering and testing, enabling the assurance provider to express a positive opinion on report accuracy. Limited assurance involves less extensive procedures and results in a negative form opinion (e.g., "nothing has come to our attention that causes us to believe..."). While reasonable assurance is theoretically more credible, limited assurance remains the dominant practice due to cost considerations and the complexity of sustainability information (Seguí-Mas et al., 2015).

Third, coverage scope distinguishes between full report assurance and partial assurance of selected indicators. Full assurance provides comprehensive verification but is more costly and time-consuming. Partial assurance allows firms to selectively verify particular metrics, potentially leading to "cherry-picking" of favorable indicators. Hummel et al. (2019) examined the role of assurance scope and found that broader coverage is associated with higher report quality and greater stakeholder trust.

Beyond external credibility signals, assurance can also generate internal organizational benefits. Steinmeier and Stich (2019) investigated whether assurance improves managerial investment decisions and found that assured sustainability information leads to more informed capital allocation, particularly in environmentally sensitive investments. This suggests that assurance can create value not only by enhancing external legitimacy but also by improving internal decision-making quality.

Nevertheless, assurance also carries important limitations. The voluntary nature of most assurance engagements, combined with the absence of standardized methodologies and quality controls, creates risks of symbolic adoption and variable quality. Boiral et al. (2019) identified significant ethical issues in assurance practice, including conflicts of interest, limited independence, superficial procedures, and emphasis on process compliance over substantive verification. These quality concerns underscore that the effectiveness of assurance depends critically on the institutional context and the specific characteristics of the assurance engagement.

2.3.3 Disclosure Regimes and Institutional Context

Disclosure regimes define whether sustainability reporting and assurance are voluntary or mandatory. This distinction has profound implications for credibility and investor perception. In voluntary systems, assurance is a discretionary choice, firms decide whether, what, and how much to assure. Consequently, motives are often strategic, and assurance outcomes vary widely. In mandatory systems, however, reporting standards and assurance requirements are externally imposed, reducing managerial discretion and improving comparability.

Krasodomska et al. (2024) document that the introduction of the NFRD increased both the prevalence and quality of assurance among EU firms. Similarly, Reverte (2021) finds that investors value assurance more strongly in countries with formal reporting requirements, suggesting that regulation enhances the perceived reliability of ESG disclosures. These results support the institutional view that rules shape credibility, where enforcement is strong, markets respond; where it is weak, symbolic adoption persists.

Regional variation also reflects deeper cultural and governance differences. Nordic countries, characterized by coordinated market economies and stakeholder-oriented governance (Hall &

Soskice, 2001; Gjølborg, 2009), encourage substantive sustainability engagement. Firms in these systems tend to adopt assurance as part of long-term accountability commitments. In contrast, firms in Southern Europe, operating in shareholder-oriented systems, often face greater legitimacy pressures and may use assurance more strategically (Jackson & Apostolakou, 2010; Braam & Peeters, 2018). The current study explicitly leverages this institutional contrast to test whether assurance effectiveness varies between Nordic and Southwest European contexts. By examining firms across both voluntary and mandatory disclosure periods, the research design provides a natural experiment for assessing how regulatory mandates interact with regional institutional differences to shape the financial consequences of sustainability assurance.

2.4 Hypotheses Development

Building on the above theoretical and empirical insights, this section formulates the hypotheses tested in this study. The overarching framework posits that sustainability performance can enhance financial outcomes, but that this relationship depends on assurance practices and institutional conditions.

2.4.1 CSP and Financial Performance

Sustainability performance signals managerial quality, operational efficiency, and long-term orientation, all factors that investors reward (Rahi et al., 2024; Coelho et al., 2023). Firms with superior ESG performance often enjoy reputational advantages, improved stakeholder relations, and lower financing costs. However, as Vargas-Santander et al. (2023) argue, these benefits accrue mainly in transparent and regulated environments. When sustainability data are unreliable, the market discounts them. The study operationalizes CSP using ESG controversy scores from LSEG Workspace, focusing on the absence of major sustainability incidents as an indicator of performance. Lower controversy exposure should be associated with better financial performance, as it signals lower reputational and operational risk. In accordance with this reasoning and corroborated by previous research findings, the following hypothesis is advanced:

H1: Corporate sustainability performance is positively associated with corporate financial performance.

2.4.2 The Moderating Role of Sustainability Assurance

Assurance reduces information asymmetry by providing external verification of ESG data. Investors interpret assured disclosures as more credible, adjusting their risk assessments accordingly (García-Sánchez et al., 2019; Martínez-Ferrero & García-Sánchez, 2017). If SA functions as intended, it should strengthen the CSP–CFP relationship by translating sustainability achievements into measurable financial value. When sustainability information is assured, stakeholders can have greater confidence in its accuracy and completeness, enabling more informed decision-making. Consequently, the reputational benefits, stakeholder support, and risk reductions associated with strong CSP should be amplified when performance is externally verified. Based on the above discussion, the following hypothesis is formulated:

H2: The presence of third-party sustainability assurance strengthens the positive relationship between CSP and CFP.

2.4.3 Assurance Quality as a Differentiating Factor

Not all assurance is equal. Assurance quality, defined by provider type, assurance level, and report coverage, determines whether assurance serves a substantive or symbolic function (Manetti & Becatti, 2009; Martínez-Ferrero & García-Sánchez, 2018; Boiral et al., 2019). High-quality assurance performed by reputable providers and covering full sustainability reports sends a credible signal of accountability, thereby enhancing investor confidence. Limited-scope or low-quality assurance, however, may not add financial value. While the theoretical logic clearly predicts that higher-quality assurance should have stronger moderating effects, this hypothesis is exploratory due to data limitations. The sample of firms with available quality data is substantially smaller than the full sample, reducing statistical power. Moreover, market participants may not fully distinguish between quality levels, particularly if assurance information

is not salient or well-understood. Grounded in the preceding rationale and substantiated by prior studies, the following hypothesis is formulated:

H3: The positive moderating effect of assurance on the CSP–CFP relationship increases with assurance quality.

2.4.4 Regulatory Context: Mandatory versus Voluntary Disclosure

Institutional regulation shapes credibility by constraining opportunistic disclosure. Under mandatory reporting frameworks such as the NFRD, assurance practices become more standardized, reducing symbolic adoption (Krasodomska et al., 2024; Reverte, 2021). Firms operating in such regimes benefit from increased investor trust and comparability. The distinction between voluntary and mandatory contexts has competing theoretical implications. On one hand, assurance under mandatory disclosure may be more substantive because regulation establishes clear standards and enforcement mechanisms. On the other hand, mandatory disclosure may encourage more pro forma compliance, with assurance adopted to check a regulatory box rather than demonstrate genuine accountability. Despite this ambiguity, the study expects that mandatory disclosure regimes strengthen the moderating role of assurance because regulation signals societal expectations for accountability and creates infrastructure that makes assurance more meaningful. Based on this reasoning and validated by the findings reported in the literature review, the following hypothesis is presented:

H4: The positive CSP–CFP relationship is stronger in mandatory disclosure regimes than in voluntary regimes.

2.4.5 Institutional Context: Nordic versus Southwest EU

Finally, institutional orientation at the country level may amplify or dampen the financial implications of sustainability assurance. In Nordic economies, stakeholder orientation and social trust encourage substantive engagement, while in Southern Europe, weaker enforcement and

more shareholder-focused governance can foster symbolic adoption (Braam & Peeters, 2018; Jackson & Apostolakou, 2010). Nordic countries are characterized by stakeholder-oriented governance, strong civil society, and deeply institutionalized sustainability norms. In this context, stakeholder expectations for CSP are high, monitoring is intense, and reputational consequences of poor performance are severe. Assurance in Nordic countries likely functions as a substantive accountability mechanism, reinforcing already strong expectations. Moreover, Nordic stakeholders may be better equipped to interpret and act upon assured sustainability information, given their familiarity with sustainability issues. These arguments collectively suggest that assurance should have a stronger moderating effect in Nordic countries, where institutional support for substantive sustainability practices is stronger. In light of the aforementioned analysis, the following hypothesis is developed.

H5: The positive CSP–CFP relationship is stronger for Nordic firms than for Southwest EU firms.

3 Methodology and Data

3.1 Research Design and Analytical Approach

This thesis employs a quantitative, longitudinal panel design to explore how CSP affects CFP, and how this relationship depends on the credibility of sustainability disclosure (through assurance) and the institutional environment in which firms operate. The empirical focus is on six European countries: Denmark, Finland, Sweden, Italy, Spain, and Portugal, representing two distinct institutional models: the stakeholder-oriented Nordic economies and the shareholder-oriented Southern European economies (Hall & Soskice, 2001; Jackson & Apostolakou, 2010). This design enables an examination of how sustainability influences firm value not only across firms and time, but also across institutional systems that differ in regulatory rigor and stakeholder engagement.

The research design is deductive and explanatory, grounded in three complementary theoretical frameworks. Stakeholder theory (Freeman, 1984) posits that firms engage in sustainability initiatives to enhance legitimacy, trust, and long-term value creation by satisfying

key stakeholder expectations. Legitimacy theory (Suchman, 1995) suggests that firms use mechanisms such as third-party assurance to signal transparency and align their operations with societal norms. Finally, institutional theory (DiMaggio & Powell, 1983; Fiss & Zajac, 2004) emphasizes how organizational behavior is shaped by institutional pressures, regulatory, normative, and cultural, leading to differences in sustainability adoption and reporting practices across contexts. These perspectives jointly motivate the central question of this study: under what institutional and assurance conditions does sustainability performance translate into superior financial outcomes?

To address this question, I estimate two-way fixed effects (TWFE) models with firm and year effects, a method increasingly adopted in sustainability-finance research (Ioannou & Serafeim, 2017; Braam & Peeters, 2018; Christensen et al., 2021; Atz et al., 2023). The TWFE approach captures within-firm variation over time, identifying how changes in sustainability performance correspond to changes in financial outcomes, while holding constant all time-invariant firm characteristics such as sector, ownership structure, and managerial style. Year fixed effects absorb macroeconomic and policy shocks that affect all firms simultaneously, such as the 2017 introduction of the EU Non-Financial Reporting Directive (NFRD). This design isolates the effect of sustainability improvements from confounding structural factors, enhancing internal validity (Friede et al., 2015).

Methodologically, the research proceeds in three stages. I first construct a multi-source firm-year panel by integrating financial, sustainability, assurance, and institutional data from 2009 to 2023. I then estimate a series of fixed-effects regressions corresponding to each hypothesis, testing both direct and moderating relationships. Finally, I assess robustness through alternative estimations, variable definitions, and diagnostic tests. Figure 3.1 provides a schematic overview of the research process, linking theoretical constructs, data sources, and estimation steps.

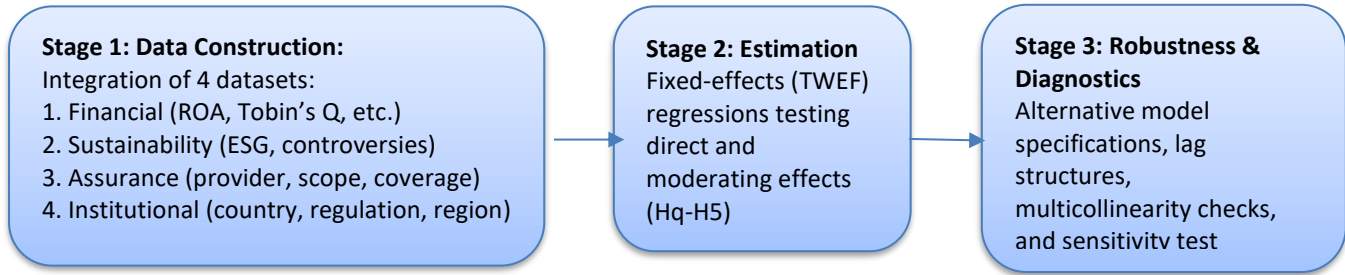


FIGURE 3.1. RESEARCH DESIGN OVERVIEW

Notes: The figures summarizes the data collection, integration, and estimation process linking theoretical constructs, variables, and analytical steps.

3.2 Data Sources

The empirical analysis relies on secondary data collected from several authoritative and complementary sources. Combining archival datasets allows for longitudinal analysis of actual corporate practices and ensures comparability across countries and industries (Christensen et al., 2021).

The primary data source is LSEG Workspace (Refinitiv Eikon), which provides standardized firm-level financial and sustainability indicators. From the file LSEG Dataset.xlsx, I extract variables for both financial performance and governance characteristics. These include Return on Assets (ROA), Tobin's Q, Total Assets, Leverage (Total Debt/Total Assets), Property, Plant & Equipment (net), Net Sales or Revenues, Fixed Assets/Common Equity, Capital Expenditure/Total Assets, and the proportion of independent board members. The same file also contains the field CSR Sustainability External Audit, indicating whether a company's sustainability report is externally assured. I recode this variable into a binary indicator (SA, where 1 = assured and 0 = not assured) to represent the presence of external sustainability assurance.

To complement this dataset, I use the Core Dataset – LSEG – ESG (3).xlsx, which provides disaggregated sustainability measures, including environmental (ENV), social (SOC), and governance (GOV) scores, as well as combined indices such as ESG (composite), ESG Controversy Score (ESGCont), and ESG Combined Score (ESGComb). These variables capture both proactive and reactive aspects of sustainability, reflecting firms' positive initiatives as well as exposure to controversies (Braam & Peeters, 2018; Atz et al., 2023). Together, these files form the quantitative backbone of the analysis.

To account for ownership and governance structures, I integrate data from BoardEx, specifically the Ownership3 top shareholders1.xlsx file, which reports the combined equity share of the top three shareholders. This variable proxies for ownership concentration and helps capture agency-related governance effects. At the country level, I include institutional quality indicators from the World Bank Worldwide Governance Indicators (WGI) dataset. The WGI measures: Rule of Law, Control of Corruption, and Government Effectiveness, capture the strength of formal institutions that shape disclosure and enforcement environments (Jackson & Apostolakou, 2010; Dimson et al., 2015).

A unique feature of this study is the integration of manually coded SA data, which significantly enriches the dataset. While LSEG's binary assurance variable indicates whether a report is externally verified, it does not distinguish between assurance providers, levels, or scopes. To address this limitation, I manually reviewed annual sustainability reports for 37 companies covering the 2017–2023 period, coding each observation for the type of assurance provider (Big 4 vs. other), level (reasonable vs. limited), and scope (full vs. partial). This resulted in three additional variables: `assurance_provider`, `sa_level`, and `sa_coverage`, where 1 indicates Big 4, reasonable, or full coverage respectively, and 0 otherwise. This manual dataset, `assurance_scope_coverage_sampling_standard_with_standards.xlsx`, represents an important methodological contribution, as it provides qualitative granularity that most large-scale databases lack (Manetti & Becatti, 2009; Boiral et al., 2019; Channuntapipat et al., 2020).

All datasets are merged in RStudio, using ISIN and fiscal year as matching keys. The merge script employs `tidyverse`, `readxl`, `janitor`, `stringr`, `lubridate`, `data.table`, `writexl`, `openxlsx`, and `readr`. Data cleaning includes the standardization of column names, normalization of identifiers, and transformation of wide-format data into long-form panels. Observations are filtered to retain only firms headquartered in the six focus countries and years 2009–2023. The resulting dataset (`panel_final.csv`) includes 797 firms and 11,955 firm-year observations. Each observation integrates firm-level financials, sustainability metrics, assurance characteristics, ownership structures, and institutional indicators. The full data dictionary is included in Appendix A.

3.3 Variable Construction

The construction of variables follows theoretical and empirical reasoning consistent with the literature on sustainability performance and financial outcomes. All variables, along with their operational definitions and data sources, are detailed in Appendix A.

CFP is measured through Return on Assets (ROA), reflecting accounting-based profitability, and Tobin's Q, representing market-based valuation. ROA captures how efficiently firms use assets to generate profit, while Tobin's Q reflects investors' perceptions of growth potential and intangible value creation (Braam & Peeters, 2018; Friede et al., 2015). These dual measures allow the study to distinguish between internal operational effects and external market responses to sustainability initiatives.

CSP is operationalized primarily through the LSEG ESG Score (`esg_score`), a composite index ranging from 0 to 100 that aggregates environmental, social, and governance dimensions. This measure is chosen because of its comprehensive coverage, standardized methodology, and comparability across firms and years. To ensure robustness, I also employ alternative CSP indicators: `esg`, `esgcont`, and `esgcomb`, from the CORE dataset, as well as individual ESG pillars (`env`, `soc`, and `gov`). Together, these measures capture both proactive ESG practices and the absence of controversies.

To account for relative sustainability performance, I construct three median-based dummies that compare each firm's ESG Score to peers within the same year, sector, or country. This relative perspective acknowledges that ESG standards vary across contexts and allows for normalization across industries and institutional settings.

The moderating variables reflect the two main contextual dimensions of the study. The first is sustainability assurance, measured by the binary `sa` variable from LSEG and complemented with `assurance_provider`, `sa_level`, and `sa_coverage` from the manual dataset. The second is the institutional and regulatory context, captured by `disclosure_regime_baseline` (1 for post-2017 years) and `disclosure_regime_custom` (1 for years after each country's NFRD implementation). Additionally, `institutional_orientation` identifies whether a country follows a stakeholder-oriented (1 for Nordics) or shareholder-oriented (0 for Southern Europe) system (Hall & Soskice, 2001; Gjølborg, 2009).

Control variables are included to reduce omitted variable bias. These include firm size (ln total assets), leverage (total debt/total assets), capital intensity (PPE/total assets), capex/total assets, fixed assets/equity, net sales, board independence, and ownership concentration. At the institutional level, governance quality is captured through Rule of Law, Control of Corruption, and Government Effectiveness from WGI (Christensen et al., 2021). All continuous variables are checked for outliers, and descriptive statistics are provided in Chapter 4.

3.4 Model Specification and Estimation Strategy

To empirically test the hypotheses, I estimate two-way fixed-effects (TWFE) regressions that control for unobserved firm-specific and year-specific heterogeneity.

The baseline TWFE model tests the direct CSP–CFP relationship and is specified as follows:

$$CFP_{it} = \alpha + \beta_1 CSP_{it} + \gamma' X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Here, CFP_{it} represents firm i 's financial performance in year t , CSP_{it} is the sustainability-performance score (measured by `esgcont` or `esg_score`), X_{it} is a vector of control variables, μ_i captures firm-specific fixed effects, λ_t represents year fixed effects, and ε_{it} is the error term. Standard errors are clustered by firm to account for autocorrelation and heteroskedasticity.

The extended TWFE model incorporates moderators to examine assurance and institutional-context effects:

$$CFP_{it} = \alpha + \beta_1 CSP_{it} + \beta_2 SA_{it} + \beta_3 (CSP_{it} \times SA_{it}) + \gamma' X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

In this equation, SA_{it} denotes the presence of sustainability assurance, while the interaction term ($CSP_{it} \times SA_{it}$) tests whether assurance strengthens the CSP–CFP relationship. Extended versions of the model also include interactions with the disclosure regime and institutional orientation to test H4 and H5.

In a further step, I test H3, which examines whether the quality of SA amplifies the relationship between CSP and CFP. To capture differences in assurance credibility, I extend the TWFE model

by including interactions between CSP and three assurance-quality dimensions: provider type (Big 4 = 1, non-Big 4 = 0), assurance level (reasonable = 1, limited = 0), and assurance coverage (full = 1, partial = 0). These variables, manually coded from sustainability reports, reflect the depth and rigor of the verification process. Each specification follows the same TWFE structure as above, ensuring that results are comparable and driven by within-firm changes over time.

Following best practices in panel-data research applied in sustainability-finance studies (Ioannou & Serafeim, 2017; Braam & Peeters, 2018; Christensen et al., 2021; Atz et al., 2023), I estimate two-way fixed-effects models with firm and year effects and cluster standard errors by firm. This specification identifies effects from within-firm variation over time while absorbing time-invariant heterogeneity and macroeconomic shocks. Country dummies are excluded because firm fixed effects already account for country-level characteristics.

Each model corresponds to one of the study's hypotheses: H1 tests whether higher CSP is associated with superior CFP, estimating the direct relationship between `esgcont` (or `esg_score`) and financial outcomes. H2 examines whether external SA strengthens this relationship by introducing an interaction term ($CSP \times SA$). H4 extends the model to assess whether disclosure regimes moderate the effect, using $CSP \times \text{Disclosure Regime}$. H5 evaluates regional differences between stakeholder- and shareholder-oriented systems through the interaction $CSP \times \text{Institutional Orientation}$. Each model builds incrementally upon the baseline, allowing for clear comparison of coefficients across hypotheses. The TWFE framework ensures that observed differences reflect within-firm changes rather than structural firm-level attributes, providing a robust test of causality (Ioannou & Serafeim, 2017; Braam & Peeters, 2018).

3.5 Diagnostic Checks and Robustness Design

To validate the robustness of results, I conduct several complementary tests. Variance Inflation Factors (VIF) confirm that multicollinearity is not an issue, with all values below 1.3. A variance decomposition analysis reveals that the ESG Controversy Score exhibits substantial within-firm variation (63.4%), supporting the use of fixed effects. To verify the stability of estimates, I re-estimate all models using the Least Squares Dummy Variable (LSDV) approach, yielding consistent results. Lagged ESG variables ($t-1$) are also introduced to mitigate potential endogeneity

concerns, and alternative ESG measures (esg, esgcomb, env, soc, gov) are tested to ensure robustness. Collectively, these checks confirm that the observed relationships are not driven by model specification or measurement artifacts (Christensen et al., 2021).

3.6 Limitations

Despite its methodological rigor, the study faces several limitations. First, while LSEG Workspace provides high-quality, standardized data, reporting practices may vary across firms and countries, introducing minor measurement inconsistencies. Second, the manually coded assurance dataset covers only 37 companies from 2017 to 2023, which, although valuable, limits external generalization. Third, institutional variables derived from WGI capture national-level governance but may overlook firm-specific dynamics. Finally, while TWFE models effectively control for time-invariant heterogeneity, residual endogeneity cannot be entirely ruled out due to potential bidirectional causality between CSP and CFP.

Nevertheless, the study's multi-source dataset, within-firm analytical design, and triangulation of quantitative and qualitative measures provide a solid foundation for credible empirical analysis. The next chapter presents the main results derived from these models and interprets them in light of the theoretical framework.

4 Results

4.1 Overview of Empirical Design

In this chapter, I present the empirical findings from my panel data analysis that examines the relationship between CSP and CFP. All models are estimated using two-way fixed effects (TWFE) with firm and year fixed effects, isolating within-firm variation over time while controlling for unobserved heterogeneity. This estimator ensures that the results reflect changes within the same firms rather than structural differences across firms or sectors.

The dataset contains 797 publicly listed firms from Denmark, Finland, Sweden, Italy, Spain, and Portugal for the years 2009–2023, producing up to 11,955 firm-year observations. The dependent variables measure two aspects of financial performance: Tobin's Q (a market-based indicator of

investors' valuation) and Return on Assets (ROA, an accounting measure of profitability). The main explanatory variable is ESG Controversy Score (*esgcont*), where higher values represent fewer controversies and thus stronger CSP. I also test the composite ESG Score (*esg_score*) and its environmental, social, and governance pillars. Control variables include firm size (*ln_assets*), leverage, capital-expenditure intensity, board independence, and ownership concentration. Moderating factors are SA, disclosure regime (mandatory vs voluntary), and regional affiliation (Nordic vs Southwest EU).

4.2 Descriptive Statistics and Diagnostics

The purpose of this section is to provide an overview of the dataset, highlight the main features of the sample, and demonstrate that the data are suitable for the applied econometric approach. Table 1 presents the descriptive statistics for all variables. The sample exhibits substantial heterogeneity across firms and years. Tobin's Q ranges from 0.7 to 12.0, with a mean, an average of 1.87 (Standard Deviation = 1.65), while ROA varies between –38% and 44%, averaging 5.1% (SD = 10.0). These distributions indicate that the dataset captures firms of varying sizes, profitability levels, and market valuations. ESG Controversy Scores are generally high (mean = 93.9, SD = 18.1), with 75% of firm-years reporting no controversies (score = 100), indicating that most firms operate without significant ESG incidents in a given year. The environmental, social, and governance pillar scores average 49.0, 57.5, and 47.8, respectively, reflecting differences in ESG maturity across dimensions and countries.

Multicollinearity diagnostics show all Variance Inflation Factors (VIFs) below 1.3, confirming that predictor correlations are low and coefficient estimates are stable (Appendix B, Table 2). A variance decomposition analysis further reveals that 63.4% of the variation in ESG Controversy Scores occurs within firms over time, providing strong justification for a two-way fixed effects (TWFE) estimator (Appendix B, Table 3). By contrast, composite ESG and pillar scores exhibit more cross-sectional (between-firm) variation, which is explored in robustness checks. These characteristics together confirm that the data are appropriate for within-firm estimation while also providing sufficient heterogeneity across countries, industries, and time to test the moderating effects of institutional factors such as assurance and disclosure regulation.

TABLE 1. DESCRIPTIVE STATISTICS

Variable	N	Mean	SD	Min	25th %ile	Median	75th %ile	Max
Dependent Variables								
Tobin's Q	2,217	1.87	1.65	0.71	1.05	1.34	1.98	11.99
ROA (%)	2,355 [†]	5.08	10.04	(37.73)	0.89	4.23	9.87	43.97
Independent Variables (ESG)								
ESG Controversy (esgcont)	5,304	93.88	18.08	0.51	100.00	100.00	100.00	100.00
Environmental Score (env)	5,283	48.98	26.69	0.00	27.49	50.82	71.25	99.11
Social Score (soc)	5,283	57.46	24.33	0.43	39.93	61.17	77.35	98.62
Governance Score (gov)	5,285	47.78	21.51	0.67	31.31	46.46	64.49	97.43
Control Variables								
Total Assets (€M)	2,429	6,918.63	20,019.26	0.62	438.18	1,247.54	4,328.87	285,783.00
Leverage (%)	2,411	28.70	17.14	0.00	16.21	26.54	38.12	76.92
Capex/Assets (capex_to_assets_c) (%)	2,338	5.02	6.41	0.00	1.88	3.51	6.07	44.68
Board Independence (%)	1,431	58.48	21.94	0.00	44.44	60.00	75.00	100.00
Ownership Top 3 (%)	2,036	15.25	8.02	0.00	9.48	14.23	19.85	96.75

Notes: The table reports descriptive statistics for the main variables used in regression analyses. N represents the number of non-missing observations. The full panel dataset contains 11,955 firm-year observations from 797 unique firms (2009-2023), but substantial missingness in key variables reduces the analytical samples. ESG measures are scaled 0-100, with higher values indicating better performance (for esgcont, env, soc, gov) or lower controversy exposure. Total Assets are reported in millions of euros (€M). Leverage, Capex/Assets (capex_to_assets_c), Board Independence, and Ownership Top 3 are expressed as percentages. Source: Author's own RStudio output (2025).

4.3 Main Findings

In this section, I present the empirical results from the two-way fixed effects (TWFE) models. Each hypothesis is tested sequentially, and key results are summarized through tables and figures. Coefficients are interpreted with reference to the theoretical expectations outlined in Chapter 2, focusing on how sustainability performance relates to financial outcomes within firms over time.

4.3.1 H1: Corporate Sustainability Performance and Financial Performance

I first test whether CSP is associated with superior financial outcomes. Table 4 presents the results from the TWFE estimations using *esgcont* as the independent variable.

For Tobin's Q, the coefficient on *esgcont* is positive but statistically insignificant ($\beta = 0.001$, SE = 0.001, $p > 0.10$). My interpretation is that short-term improvements in a firm's controversy record do not translate into immediate market revaluation. Investors may hesitate to react to incremental ESG changes, either because such signals are difficult to verify or because their financial relevance is perceived as limited in the short run.

For ROA, the coefficient is positive and marginally significant ($\beta = 0.021$, SE = 0.012, $p < 0.10$), indicating that firms with fewer controversies enjoy slightly higher accounting profitability. In practical terms, a one-standard-deviation improvement in the ESG Controversy Score corresponds to roughly a 0.4-percentage-point rise in ROA. Although modest, this suggests that the benefits of sustainability efforts are first visible through operational efficiency and stakeholder relations rather than through market valuation.

Overall, my analysis provides limited within-firm evidence of a direct CSP–CFP relationship, consistent with prior studies reporting mixed results (Friede et al., 2015; Braam & Peeters, 2018). In my view, these findings imply that sustainability improvements contribute more to long-term credibility and resilience than to immediate financial gains.

TABLE 4. BASELINE H1: CSP AND FINANCIAL PERFORMANCE (TWFE)

Variable	TWFE: Tobin's Q	TWFE: ROA
ESG Controversy (<i>esgcont</i>)	0.001	0.021*

Variable	TWFE: Tobin's Q	TWFE: ROA
	(0.001)	(0.012)
Firm Size (ln_assets_c)	-0.325**	0.218
	(0.160)	(1.416)
Leverage (leverage_c)	-0.012**	-0.185***
	(0.005)	(0.028)
Capex/Assets (capex_to_assets_c)	0.038***	0.138
	(0.010)	(0.160)
Fixed Assets/Equity (fixed_assets_to_equity_c)	-0.000	-0.001***
	(0.000)	(0.000)
Board Independence (board_independent)	0.001	-0.011
	(0.004)	(0.022)
Ownership Top 3 (ownership_top3_c)	-0.012	-0.151
	(0.012)	(0.093)
R ²	0.091	0.105
Adj. R ²	-0.080	-0.065
Num. obs.	1272	1271

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. TWFE models include firm and year fixed effects with clustered standard errors. All continuous variables are mean-centered. *Source:* Author's own RStudio output (2025).

To visualize the magnitude and precision of the estimated effects, Figure 4.1 presents the coefficients of ESG controversies (esgcont) from TWFE regressions. The plot illustrates the within-firm variation in sustainability performance and its limited explanatory power for financial outcomes once firm and year heterogeneity are accounted for.

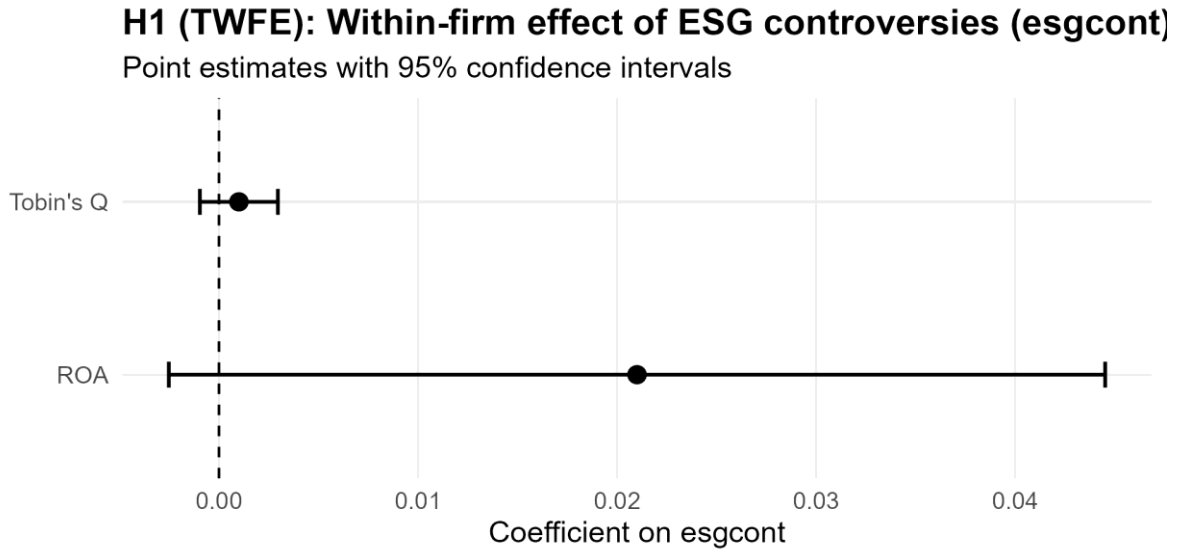


FIGURE 4.1. H1 (TWFE): WITHIN-FIRM EFFECT OF ESG CONTROVERSIES

Notes: The figure displays coefficient estimates and 95 % confidence intervals from the two-way fixed-effects (TWFE) regressions testing H1. The estimated coefficients on the ESG Controversy Score (esgcont) are small and statistically insignificant for Tobin's Q, while slightly positive but imprecisely estimated for ROA. This suggests that improvements in sustainability performance, as measured by fewer ESG controversies, are not systematically associated with short-term market valuation or profitability once firm and year effects are controlled for. *Source:* Source: Author's own RStudio output (2025).

4.3.2 H1: Extended: ESG Dimensions

To better understand which aspects of sustainability performance drive financial outcomes, I extend the baseline model by separating the aggregate ESG Score into its three components: environmental (ENV), social (SOC), and governance (GOV). This step helps identify whether markets value all sustainability dimensions equally or reward specific types of improvement more strongly. Table 5 presents the two-way fixed effects (TWFE) results for each pillar, estimated with the same control variables and fixed-effects structure described in Chapter 3.

My analysis shows clear differences across dimensions. Improvements in environmental and social performance are both positively and significantly associated with Tobin's Q, whereas the governance dimension remains economically and statistically insignificant. The environmental pillar has the strongest effect, suggesting that investors particularly reward firms that reduce operational risks, improve energy efficiency, or innovate in cleaner production. The social pillar

also contributes positively, reflecting how strong employee relations, community engagement, and responsible supply-chain management enhance a firm's reputation and stability.

By contrast, governance factors such as board composition or shareholder rights appear to have little short-term impact on market valuation once firm-specific heterogeneity is controlled for. In my view, governance may serve more as a long-term enabling mechanism that supports accountability rather than as a direct driver of immediate financial value.

These results indicate that markets do differentiate among ESG dimensions. Environmental and social initiatives seem to generate more visible financial recognition, while governance improvements play a subtler, long-run role in sustaining legitimacy. This extended analysis therefore refines H1 by showing that the CSP–CFP link is largely driven by the E and S pillars of ESG. I return to this point in Chapter 5, where I discuss how stakeholder expectations and legitimacy pressures vary across sustainability domains.

TABLE 5. H1 EXTENDED RESULTS BY ESG DIMENSION.

	ENV	SOC	GOV
(Intercept)	1.676*** (0.001)	1.362*** (0.001)	
env	0.005*** (0.001)		
soc		0.009*** (0.001)	
gov			-0.000 (0.002)
ln_assets (centered)	-0.269*** (0.001)	-0.299*** (0.001)	-0.326** (0.162)
leverage (centered)	-0.031*** (0.001)	-0.032*** (0.001)	-0.012** (0.005)

TABLE 5. H1 EXTENDED RESULTS BY ESG DIMENSION.

	ENV	SOC	GOV
capex_to_assets_c (centered)	0.018*** (0.001)	0.019*** (0.001)	0.039*** (0.011)
fixed_assets_to_equity (centered)	0.000 (0.001)	0.000 (0.001)	-0.000 (0.000)
board_independent	0.001 (0.001)	0.002 (0.001)	0.001 (0.004)
ownership_top3 (centered)	-0.025*** (0.001)	-0.024*** (0.001)	-0.012 (0.012)
R ²	0.237	0.244	0.091
Adj. R ²	0.206	0.213	-0.081
Num. obs.	183	183	1270

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Each column represents a separate regression with a different ESG dimension as the main independent variable. *Source:* Author's own RStudio output (2025).

4.3.3 H2: Moderating Effect of Sustainability Assurance

Next, I test whether SA strengthens the CSP–CFP link. The assurance variable (*sa_clean*) equals 1 for firm-years with externally assured sustainability reports.

Table 6 presents the TWFE regression results with the interaction term between ESG controversy score (*esgcont*) and the assurance dummy variable (*sa_clean*). The main effect of *esgcont* remains statistically insignificant in both models Tobin's Q and ROA. Specifically, for Tobin's Q, the coefficient on the interaction is near zero ($\beta = 0.002$, $p = 0.70$). For ROA, it is also small and insignificant ($\beta = -0.008$, $p = 0.83$). My interpretation is that firms with assured sustainability reports do not display stronger relationship between sustainability performance and financial outcomes than those without assurance.

This null result, which I refer to as the “Green Assurance Paradox”, challenges expectations from stakeholder and legitimacy theory. While assurance is designed to enhance the credibility of sustainability reporting, the absence of measurable financial effects suggests that enhanced credibility alone does not necessarily yield economic returns. This does not necessarily imply that assurance or sustainability practices are ineffective; rather, the credibility gained from assurance may not translate into immediate financial recognition. Substantive sustainability initiatives often involve upfront costs and long payback periods, while the benefits, such as improved reputation, risk management, or stakeholder trust, may materialize only gradually. In many cases, firms may also adopt assurance for symbolic or reputational reasons rather than as a tool for deeper accountability. From a policy perspective, stronger institutional incentives and enforcement mechanisms may be necessary to ensure that assurance contributes to genuine, long-term value creation rather than serving mainly as a compliance signal. In short, H2 is not supported: assurance does not amplify the financial benefits of sustainability performance, at least not in the short to medium term.

TABLE 6. H2: MODERATING EFFECT OF SUSTAINABILITY ASSURANCE.

	Interaction: Q	Interaction: ROA
ESG Controversy (esgcont)	-0.000 (0.004)	0.035 (0.034)
Assurance (sa_clean)	-0.338 (0.503)	0.209 (3.652)
esgcont × sa_clean	0.002 (0.005)	-0.008 (0.039)
Firm Size (ln_assets_c)	-0.316* (0.161)	0.074 (1.415)
Leverage (leverage_c)	-0.010**	-0.168***

	Interaction: Q	Interaction: ROA
	(0.005)	(0.028)
Capex/Assets (capex_to_assets_c)	0.039***	0.141
	(0.011)	(0.168)
Fixed Assets/Equity	-0.000	-0.000
	(0.000)	(0.001)
Board Independence	-0.001	-0.012
	(0.004)	(0.024)
Ownership Top 3	-0.016	-0.170*
	(0.014)	(0.100)
R ²	0.100	0.103
Adj. R ²	-0.055	-0.052
Num. obs.	1142	1141

Notes: Robust standard errors clustered at firm level in parentheses. *** p<0.01, ** p<0.05, * p<0.10. sa_clean = binary indicator for presence of sustainability assurance. *Source:* Author's own RStudio output (2025).

4.3.4 H3: Assurance Quality Dimensions (Exploratory Analysis)

Given the null finding for overall assurance, I next explore whether specific quality dimensions moderate the CSP–CFP relationship. I examine three quality indicators: provider type (Big 4 accounting firms versus non-Big 4), assurance level (reasonable versus limited assurance), and coverage scope (comprehensive versus partial). I also examine composite measures combining these attributes.

I emphasize that this analysis is exploratory rather than confirmatory, reflecting severe data limitations. It draws on a manually coded subsample of 37 firms observed from 2017 to 2023, yielding only 192–205 firm-year observations (less than 2 % of the full panel) per model after merging with financial variables. While the smaller sample limits the generalizability of the results,

it provides valuable qualitative insight into how assurance provider type, level, and coverage influence the CSP–CFP relationship.

Table 7 summarizes the results. When using `esg_score` as the primary sustainability measure, the interaction between CSP and Big 4 provider is positive but statistically insignificant ($\beta = 0.005$, $SE = 0.023$, $p = 0.82$). In plain terms, firms audited by Big 4 accounting firms do not exhibit stronger sustainability–performance links than those assured by other providers. The interaction between CSP and assurance level (reasonable vs. limited) is negative and marginally significant ($\beta = -0.027$, $SE = 0.016$, $p < 0.10$), suggesting that higher assurance levels may be associated with slightly weaker short-term financial outcomes, possibly because firms requesting more rigorous verification do so in response to reputational or risk concerns rather than superior performance. The assurance coverage interaction (full vs. partial) is negative and statistically significant at the 5% level ($\beta = -0.009$, $SE = 0.004$, $p < 0.05$), indicating that firms providing full assurance tend to display marginally lower contemporaneous market valuations, although the economic magnitude of this effect is small.

When repeating the analysis using `esgcont` (ESG Controversy Score) as the CSP measure, the interaction results are similarly weak. The Big 4 provider interaction remains insignificant ($\beta = 0.001$, $SE = 0.003$, $p > 0.10$), while assurance level becomes positive and significant ($\beta = 0.006$, $SE = 0.002$, $p < 0.01$), indicating that reasonable-level assurance may coincide with a slightly stronger connection between controversy management and market value, though the economic impact remains minimal.

In my interpretation, these results suggest that assurance quality currently plays a weak and inconsistent role in shaping financial outcomes. The coefficients are small and directionally unstable, and the relatively large standard errors reflect low statistical precision rather than strong underlying effects. In other words, while assurance quality likely matters in theory, the evidence here cannot yet confirm it in practice.

From a broader perspective, this pattern fits within the “Green Assurance Paradox” identified earlier: even where assurance is conducted by reputable providers or at higher levels, its financial impact remains limited. The issue may lie not in the concept of assurance itself but in its uneven implementation across firms and jurisdictions.

In my view, these exploratory findings highlight both a challenge and an opportunity. They reveal how underdeveloped the assurance market still is, but also how much potential it holds under stronger regulatory conditions. As assurance becomes standardized and mandatory under the CSRD, future studies with richer datasets will be able to test whether assurance quality finally evolves from symbolic compliance into a genuine driver of trust and accountability.

TABLE 7. H3: ASSURANCE QUALITY DIMENSIONS (EXPLORATORY ANALYSIS)

Interaction Term	Coefficient	Std. Error	p-Value	N_obs
esg_score:provider_big4	0.0051	0.0229	0.8233	205
esg_score:sa_level	-0.0268	0.0155	0.0859	205
esg_score:sa_coverage	-0.0087	0.0039	0.0255	205
esgcont:provider_big4	0.0011	0.0027	0.6526	192
esgcont:sa_level	0.0058	0.0022	0.0098	192
esgcont:sa_coverage	0.003	0.0026	0.2446	192

Notes: Interaction effects between corporate sustainability performance (CSP) and assurance-quality dimensions are weak and inconsistent. Only the assurance-level variable (reasonable vs. limited) shows a small positive association with financial performance; other dimensions have no significant influence on the CSP–CFP relationship. *Source:* Author’s own RStudio output (2025).

4.3.5 H4: Moderating Role of the Disclosure Regime

In this part of the analysis, I investigate how the institutional environment specifically, mandatory versus voluntary sustainability disclosure, shapes the relationship between CSP and CFP. I further explore whether external assurance adds any additional credibility effect once disclosure regulation is in place.

Two-Way Interaction (Table 8). I begin with the baseline model that includes the interaction between CSP and the disclosure regime (CSP × Disclosure_Regime_Custom). The results, shown in Table 8, indicate that the interaction coefficient is positive and statistically significant ($\beta = 0.010$, $SE = 0.004$, $p < 0.01$). This finding suggests that under mandatory reporting regimes, such as those introduced through the EU Non-Financial Reporting Directive (NFRD), firms with stronger

sustainability performance tend to be rewarded more by the market. In other words, investors appear to assign higher value to sustainability information when it is disclosed within a regulated, standardized framework.

The economic magnitude of this effect is moderate but meaningful. A one-point increase in ESG Score under a mandatory disclosure regime corresponds to roughly a 1% increase in Tobin's Q. I interpret this as evidence that formal reporting mandates enhance the financial relevance of sustainability performance by improving data credibility and comparability across firms.

The main effect of the disclosure regime variable itself is negative and significant ($\beta = -0.653$, $p < 0.05$), reflecting structural differences between firms that voluntarily reported prior to regulation and those that were required to begin doing so after 2017. The assurance variable remains insignificant, consistent with results from H2, indicating that external verification alone does not drive improved financial outcomes.

TABLE 8. H4: MODERATING ROLE OF THE DISCLOSURE REGIME

	TWFE: Tobin's Q	TWFE: ROA
esg_score	-0.004 (0.004)	0.015 (0.033)
disclosure_regime_custom	-0.653** (0.257)	0.905 (2.550)
ln_assets_c	-0.390** (0.158)	0.330 (1.408)
leverage_c	-0.011** (0.005)	-0.194*** (0.029)
capex_to_assets_c	0.040*** (0.010)	0.149 (0.154)

	TWFE: Tobin's Q	TWFE: ROA
fixed_assets_to_equity_c	-0.000	-0.001**
	(0.000)	(0.000)
board_independent	-0.001	-0.005
	(0.004)	(0.021)
ownership_top3_c	-0.008	-0.101
	(0.010)	(0.084)
esg_score:disclosure_regime_custom	0.010***	0.002
	(0.004)	(0.035)
R ²	0.104	0.104
Adj. R ²	-0.060	-0.061
Num. obs.	1317	1316

***p < 0.01; **p < 0.05; *p < 0.1

Notes: TWFE models include firm and year fixed effects with clustered standard errors. The interaction term tests whether mandatory sustainability disclosure under the EU NFRD strengthens the CSP–CFP relationship. *Source:* Author's own RStudio output (2025).

To illustrate the interaction visually, Figure 4.2 plots the marginal effects of ESG performance under voluntary and mandatory disclosure regimes. The steeper slope under the mandatory setting confirms that regulation enhances the market's sensitivity to sustainability performance, reinforcing the idea that credible, standardized disclosure drives financial recognition.

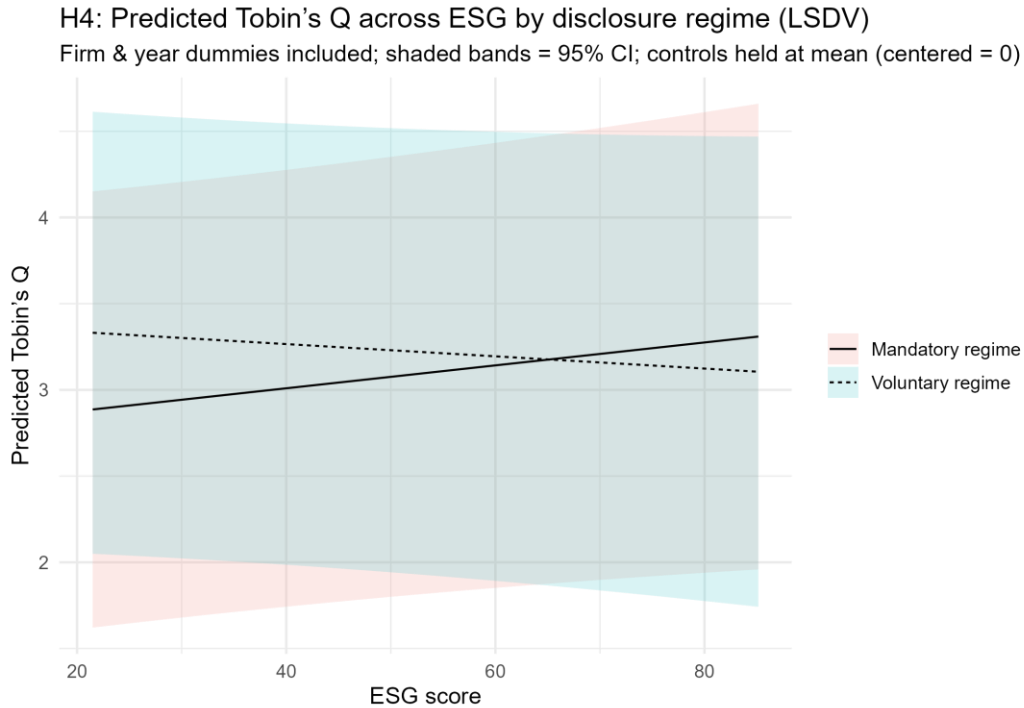


FIGURE 4.2. MARGINAL EFFECTS OF ESG × DISCLOSURE REGIME

Notes: Predicted Tobin's Q across ESG by disclosure regime (LSDV). Firms operating under mandatory disclosure regimes exhibit a steeper positive ESG–Q slope, confirming that regulatory context enhances the financial relevance of sustainability performance. Source: Author's own RStudio output (2025).

Three-Way Interaction (Table 9). I then extend the model to test whether external assurance amplifies the credibility benefits of mandatory disclosure by including a three-way interaction term (CSP × SA × Disclosure_Regime_Custom). As shown in Table 9, the three-way coefficient is negative and insignificant ($\beta = -0.016, p > 0.10$). The two-way CSP × Disclosure term remains positive and significant ($\beta = 0.019, p < 0.05$), reinforcing the conclusion that disclosure regulation, rather than assurance, is the primary mechanism through which sustainability performance translates into financial value.

TABLE 9. H4 EXTENDED: ESG × SA × DISCLOSURE REGIME

	H4ext: Q
esg_score	-0.004 (0.006)
sa_clean	-0.604 (0.473)

	H4ext: Q
disclosure_regime_custom	-1.129** (0.518)
ln_assets_c	-0.406** (0.164)
leverage_c	-0.008* (0.005)
capex_to_assets_c	0.040*** (0.011)
fixed_assets_to_equity_c	-0.000 (0.000)
board_independent	-0.003 (0.004)
ownership_top3_c	-0.015 (0.014)
esg_score:sa_clean	0.006 (0.008)
esg_score:disclosure_regime_custom	0.019** (0.009)
sa_clean:disclosure_regime_custom	0.967 (0.795)
esg_score:sa_clean:disclosure_regime_custom	-0.016 (0.012)
R ²	0.117
Adj. R ²	-0.033
Num. obs.	1180

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Notes: To ensure that these findings are not model-specific, I perform several robustness checks. The Least Squares Dummy Variable (LSDV) model produces consistent results, with a positive and significant CSP × Disclosure interaction ($\beta = 0.010$, $p < 0.01$), confirming that the outcome is not sensitive to the fixed-effects estimation method. Models incorporating one-year lagged ESG variables yield similar results, suggesting that the observed effects are not driven by reverse causality. Finally, substituting alternative sustainability metrics (esg, esgcomb, env, soc, gov) confirms that the positive moderation effect of disclosure regulation persists across ESG constructs, reinforcing the conclusion that the institutional framework, rather than assurance, drives the observed pattern. *Source:* Author's own RStudio output (2025).

Overall, the findings provide partial support for H4. The positive and significant CSP × Disclosure interaction demonstrates that mandatory disclosure regimes enhance the financial relevance of sustainability performance, whereas external assurance offers no additional moderating effect once regulation is in place. These results highlight that institutional enforcement, rather than voluntary assurance, is the dominant mechanism improving the credibility and valuation impact of sustainability reporting.

4.3.6 H5: Regional Differences (Nordic vs Southwest EU)

In this final analysis, I explore whether the relationship between CSP and CFP varies between stakeholder-oriented Nordic countries (Denmark, Finland, Sweden) and shareholder-oriented Southwest European countries (Italy, Spain, Portugal). This test captures whether deeper societal norms, beyond formal regulation, still shape the financial materiality of sustainability.

Two-Way Interaction (Table 10). The baseline model includes the interaction between CSP and regional orientation (CSP × Region_Nordic). The results, reported in Table 10, indicate that the coefficient is positive but statistically insignificant ($\beta = 0.006$, $SE = 0.004$, $p > 0.10$). This indicates that the CSP–CFP relationship does not differ significantly across regions, although the positive direction suggests that Nordic firms may gain slightly more financial benefit from sustainability improvements than their Southern European counterparts.

In my view, this weak difference reflects a Europe that is becoming more institutionally unified. Historically, Nordic economies have been more stakeholder-oriented, with stronger social norms supporting transparency and long-term value creation. However, the spread of mandatory disclosure frameworks and investor ESG integration appears to have narrowed the regional gap, aligning markets' reactions to sustainability information.

The magnitude of the coefficient is small, implying that even if the difference exists, its financial relevance is limited. The lack of statistical significance suggests that formal disclosure requirements and assurance practices now play a more homogenizing role in Europe, reducing regional variation in how markets respond to sustainability performance.

TABLE 10. H5: REGIONAL DIFFERENCES (NORDIC VS. SOUTHWEST EU)

	Tobin's Q	ROA
ESG Controversy (esgcont)	-0.001 (0.001)	0.007 (0.012)
esgcont × region_nordic	0.006 (0.004)	0.042 (0.026)
Firm Size (ln_assets_c)	-0.355** (0.151)	-0.169 (1.125)
Leverage (leverage_c)	-0.011** (0.004)	-0.184*** (0.026)
capex_to_assets_c	0.030*** (0.010)	0.173 (0.157)
fixed_assets_to_equity_c	-0.000 (0.000)	-0.001*** (0.000)
board_independent	0.001 (0.004)	-0.014 (0.020)
ownership_top3_c	-0.014 (0.014)	-0.137 (0.094)
R ²	0.103	0.126
Adj. R ²	-0.054	-0.027
Num. obs.	1272	1271

***p < 0.01; **p < 0.05; *p < 0.1

***p < 0.01; **p < 0.05; *p < 0.1

Notes: The interaction term tests whether the CSP-CFP relationship differs between Nordic and Southwest EU countries. *Source:* Author's own RStudio output (2025).

To test whether assurance further moderates these regional patterns, I extend the model to include a three-way interaction term (CSP × SA × Region_Nordic). The results, reported in Table 11, indicate that the coefficient for this interaction is negative and statistically insignificant ($\beta = -0.014$, SE = 0.018, $p > 0.10$), indicating that assurance does not alter the regional differences in

the CSP–CFP relationship. The two-way interaction (CSP × Region_Nordic) remains positive but insignificant ($\beta = 0.009$, $SE = 0.012$, $p > 0.10$), confirming that any regional effect is weak and not statistically meaningful. I interpret these results as evidence that institutional orientation alone does not drive financial returns from sustainability performance once regulatory and assurance mechanisms are considered. In practice, this suggests that the increasing harmonization of EU reporting standards and investor expectations has narrowed the institutional gap between Nordic and Southern European firms.

Although H5 is not statistically supported, the direction of the coefficients aligns with institutional theory, stakeholder-oriented systems remain slightly more receptive to sustainability, but their advantage is shrinking as Europe converges under shared rules and investor expectations.

TABLE 11. H5 EXTENDED: ESG × SA × REGION

Variable	Coefficient	Std. Error	Interpretation
esg_score:region_nordic	0.009	0.012	Positive but insignificant; Nordic firms may gain slightly more from CSP, but difference is not statistically reliable.
esg_score:sa_clean: region_nordic	-0.014	0.018	Insignificant three-way interaction; assurance does not amplify regional differences in the CSP–CFP relationship.

Notes: Neither regional orientation nor assurance significantly moderates the link between sustainability performance and financial value. This suggests that the EU’s harmonized reporting environment has largely reduced regional variation in how markets respond to sustainability performance. *Source:* Author’s own RStudio output (2025).

4.4 Robustness Checks

To ensure that the results are not sensitive to estimation choices or measurement design, I conduct several robustness tests addressing estimator consistency, endogeneity, and measurement sensitivity. All models retain firm- and year-fixed effects, with standard errors clustered at the firm level. Full regression outputs are provided in Appendix C (Tables 12–14).

Estimator consistency (LSDV). First, I re-estimate the baseline models using the Least Squares Dummy Variable (LSDV) specification, which includes explicit firm dummies rather than relying on within transformation. The results remain almost identical to the two-way fixed effects (TWFE) models in both sign and significance (see Appendix C, Table 12). This confirms that the findings are not sensitive to the estimation approach and that unobserved heterogeneity is properly controlled.

Lagged ESG (Endogeneity check). Second, to assess potential reverse causality, whether stronger financial performance might precede and motivate higher ESG engagement, I estimate a one-year lagged ESG model ($t-1$). The lagged ESG term is statistically insignificant ($\beta = 0.000$, $SE = 0.002$, $p > 0.10$), suggesting that prior financial results do not predict subsequent changes in sustainability performance (Appendix C, Table 13). This supports the interpretation that the CSP–CFP association observed in earlier models is not driven by endogeneity.

Alternative ESG measures (Dimensional robustness). Finally, I test whether the results depend on how corporate sustainability performance is measured. Using alternative ESG constructs: ESG Combined, Environmental (ENV), Social (SOC), and Governance (GOV) pillars, I find consistent coefficients across specifications. None of the alternative indicators show significant relationships with financial performance at conventional levels, though the environmental pillar exhibits a weak positive trend ($\beta = 0.005$, $p \approx 0.10$). These findings (Appendix C, Table 14) reinforce that the null or modest results reported earlier are not artifacts of measurement choice.

Taken together, these robustness checks demonstrate that the results are stable across model specifications and variable definitions. The findings remain consistent with the conclusion that SA and institutional context do not systematically alter the relationship between sustainability and financial performance.

4.5 Summary of Findings

In summary, I find limited direct evidence that sustainability performance (CSP) improves financial outcomes within firms, though profitability (ROA) shows a weak positive association. The results, reported in Table 15 and in Figure 4.3, indicate that, the moderating effect of assurance is absent, suggesting that firms often adopt SA symbolically rather than as a driver of financial

value. In contrast, disclosure regulation emerges as a significant contextual factor: under mandatory reporting regimes, ESG performance is rewarded by the market, highlighting the importance of institutional frameworks for translating sustainability into economic value. These findings collectively suggest that sustainability assurance, in its current form, does not strengthen the CSP–CFP link, whereas institutionalized disclosure practices do. This pattern will be further interpreted in Chapter 5, where I discuss how these results relate to stakeholder theory, legitimacy theory, and the broader literature on corporate sustainability.

TABLE 15. SUMMARY OF HYPOTHESIS TESTING RESULTS

Hypothesis	Predicted effect	Key finding	Result
H1: CSP → CFP	Positive	Tobin's Q: $\beta = 0.001$, SE = 0.001, $p > 0.10$ (TWFE). ROA: $\beta = 0.021$, SE = 0.012, $p < 0.10$ (TWFE).	Mixed support
H2: SA moderates CSP → CFP	Positive moderation	Q: $\text{esgcont} \times \text{sa_clean}$ $\beta = 0.002$, $p = 0.70$. ROA: $\beta = -0.008$, $p = 0.83$.	Not supported
H3: Assurance quality moderates	Stronger moderation	$\text{esg_score} \times \text{provider_big4}$: $\beta = 0.005$, $p = 0.823$. $\text{esg_score} \times \text{sa_level}$: $\beta = -0.0268$, $p = 0.0859$. $\text{esg_score} \times \text{sa_coverage}$: $\beta = -0.0087$, $p = 0.0255$. $\text{esgcont} \times \text{provider_big4}$: $\beta = 0.0011$, $p = 0.6526$. $\text{esgcont} \times \text{sa_level}$: $\beta = 0.0058$, $p = 0.0098$. $\text{esgcont} \times \text{sa_coverage}$: $\beta = 0.0030$, $p = 0.2446$. <i>(N≈192–205; exploratory)</i>	Exploratory / null or small mixed effects
H4: Mandatory regime enhances CSP → CFP	Stronger in mandatory	Q: $\text{esg_score} \times \text{disclosure_regime_custom}$ $\beta = 0.010$, SE = 0.004, $p < 0.01$ (TWFE). Robust in LSDV, lags, and alternative CSP metrics.	Supported
H5: Nordic enhances CSP → CFP	Stronger in Nordic	Q: $\text{esgcont} \times \text{region_nordic}$ $\beta = 0.006$, SE = 0.004, $p > 0.10$ (TWFE). Three-way with SA: $\beta = -0.014$, $p > 0.10$.	Not supported

Notes: The interaction term tests whether the CSP-CFP relationship differs between Nordic and Southwest EU countries. Source: Author's own RStudio output (2025).

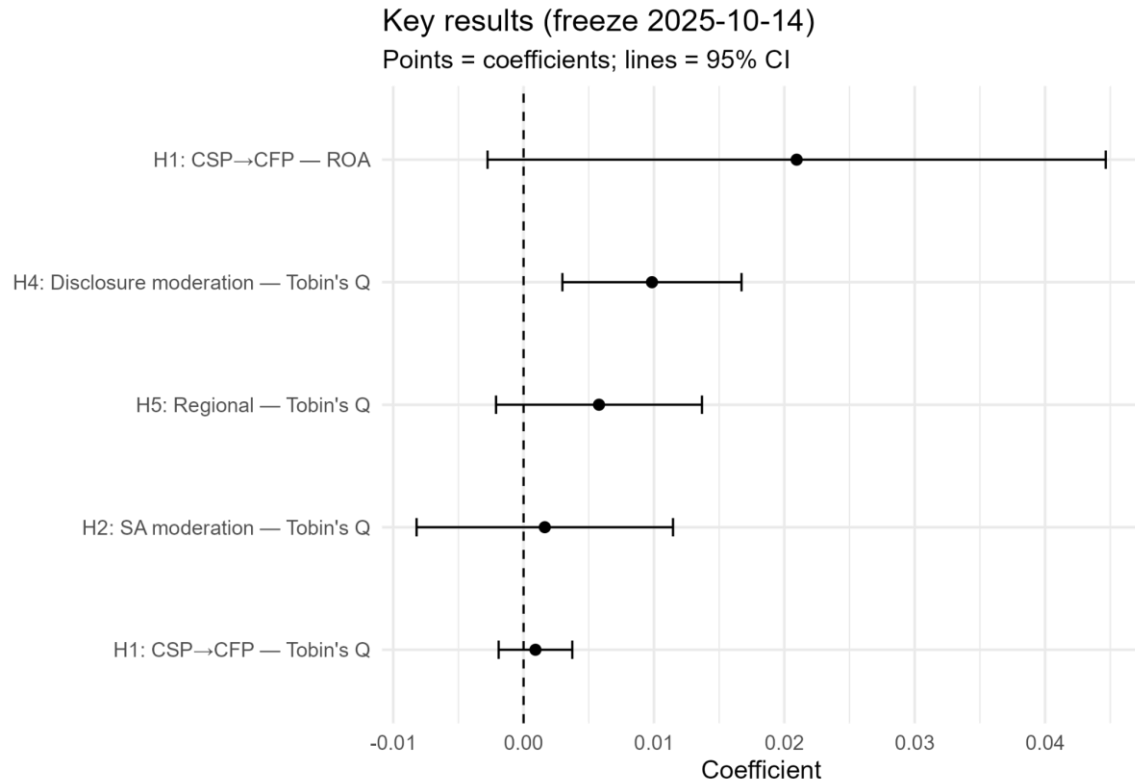


FIGURE 4.3. KEY RESULTS (H1–H5)

Notes: Key results (H1–H5) with 95% confidence intervals. Only the disclosure-regime moderation (H4) exhibits a statistically significant positive coefficient, while other hypotheses yield null or weak effects. Source: Author's own RStudio output (2025).

5 Discussion and Conclusion

5.1 Overview of Findings

In this chapter, I interpret the empirical results from Chapters 4 through the lenses of credibility and institutional context. My analysis shows that across firms in Denmark, Finland, Sweden, Italy, Spain, and Portugal, the link between CSP and CFP is subtle but meaningful. Profitability, measured by ROA, improves modestly with stronger sustainability performance, while market valuation (Tobin's Q) remains largely unaffected. In my view, this pattern suggests that sustainability creates operational rather than speculative value, it strengthens efficiency, resilience, and stakeholder relations before financial markets fully recognize its impact.

The most striking finding is what I term the “Green Assurance Paradox”. Despite the theoretical expectation that external SA should enhance the credibility of disclosures and improve financial outcomes, my results show no consistent moderation of the CSP–CFP relationship when assurance is present. This aligns with previous research indicating that assurance is often heterogeneous in scope and quality and may be used symbolically rather than substantively (Boiral et al., 2019; Hummel et al., 2019; Michelon et al., 2019). In practice, some firms appear to pursue assurance mainly to signal legitimacy or compliance rather than to strengthen transparency and accountability.

By contrast, institutional mechanisms play a decisive role. I find that under mandatory disclosure regimes, such as the EU’s Non-Financial Reporting Directive (NFRD), the relationship between sustainability performance and market valuation becomes significantly stronger. This finding is consistent with prior work showing that enforcement, comparability, and investor protection enhance the financial materiality of sustainability information (Reverte, 2021; García-Sánchez et al., 2019). From my analysis, this demonstrates that credible rules outperform voluntary signals: when sustainability reporting is embedded within formal institutional frameworks, it becomes more trustworthy and valuable to both investors and society.

Taken together, these findings reveal an important message for both scholarship and practice. Sustainability creates value, but institutions sustain it. My study shows that voluntary efforts, such as assurance, can enhance visibility but rarely produce measurable financial returns unless backed by credible regulation. In my view, this has clear societal relevance: as Europe moves toward the CSRD, the combination of transparency, verification, and enforcement will be critical for transforming sustainability from a communication exercise into a genuine accountability mechanism. Ultimately, the results point to a broader truth, the truth that markets alone cannot guarantee responsibility; it is robust institutions, public trust, and ethical commitment that turn sustainability into long-term value for both companies and communities.

The next sections unpack these points in detail: I first revisit the CSP–CFP link (5.2), then discuss the “Green Assurance Paradox” (5.3), and finally show how disclosure regimes and regional context shape outcomes (5.4), before drawing broader implications and limitations.

5.2 The CSP–CFP Relationship Revisited

My analysis shows that when I track the same firm over time, profitability inches up as sustainability performance improves, whereas market valuation barely moves. In other words, the CSP–CFP link in my data looks more like an operational story than an immediate pricing story. This pattern aligns with recent reviews showing that while the “business case” for sustainability generally holds, its strength and visibility differ across measurement methods, time frames, and institutional settings (Coelho et al., 2023; Robles-Elorza et al., 2023; Rahi et al., 2024; Soriano & Fong, 2023).

Why would ROA respond when Tobin’s Q does not? In my view, ESG improvements operate mainly through process and stakeholder channels, reducing frictions with employees and communities, improving resource efficiency, and preventing incident-driven disruptions before they translate into external valuation gains. This interpretation is consistent with studies showing that sustainability engagement can boost innovation and operational efficiency (Aftab et al., 2024) and that visible, outward-facing ESG activities enhance customer loyalty and marketing productivity (Weinmayer et al., 2024).

The muted or null response of Tobin’s Q can also be understood in light of investor behavior. Market-based indicators often react only when sustainability information is credible, comparable, and perceived as decision-useful. Prior research documents that inconsistent or boilerplate ESG disclosure weakens investors’ ability to distinguish genuine performance from symbolic communication (Lee et al., 2023; Jadoon et al., 2021). My Chapter 4 finding that mandatory disclosure strengthens the CSP–Q link fits this pattern: when reporting becomes standardized and verified, investors respond more positively (Reverte, 2021; Yao et al., 2024).

In addition, several recent studies highlight that the financial effect of sustainability is not linear. Moderate levels of ESG engagement tend to enhance firm value, but excessive or poorly targeted initiatives may generate costs or investor skepticism, leading to diminishing returns (Teng et al., 2024; Coelho et al., 2023). This resonates with my data, where sustainability’s profitability benefits are modest but robust, while market reactions remain subdued.

From a societal standpoint, I believe this asymmetry between accounting and market responses underscores a broader timing gap: firms may already be creating real environmental and social

value, yet capital markets are slower to recognize and reward it. Bridging this lag between doing good and being valued for doing good requires stronger assurance, consistent disclosure, and long-term investor orientation. In my view, this is precisely where policy frameworks such as the EU's CSRD can make a transformative difference by aligning financial markets with sustainability goals and ensuring that social progress and profitability advance together.

Methodologically, my lagged-ESG specification confirms that these profitability gains are not merely driven by high-performing firms investing more in ESG after profitable years. This supports the idea that sustainability improves operations over time rather than reflecting reverse causality, a pattern also emphasized in meta-reviews (Coelho et al., 2023; Rahi et al., 2024).

In sum, my findings suggest that sustainability performance helps firms operate more responsibly and efficiently, a benefit that is visible in profitability but not yet fully capitalized in market valuation. The next section examines why external assurance, designed to close this credibility gap, has not yet unlocked stronger financial payoffs, the phenomenon I describe as the "Green Assurance Paradox".

5.3 The Green Assurance Paradox

One of the most surprising findings of my analysis is that SA does not strengthen the relationship between sustainability performance and financial performance. This outcome runs counter to what both stakeholder theory and legitimacy theory would predict. In principle, external assurance should enhance the credibility of sustainability disclosures, reduce information asymmetry, and foster stakeholder trust, mechanisms shown by Cheng et al. (2015) and Al-Shaer & Zaman (2019) to support reputational and financial benefits. Yet in practice, my results show no measurable moderation effect, suggesting that these theoretical mechanisms often fail to materialize.

The "Green Assurance Paradox", introduced in this thesis, captures this disconnect between assurance's intended purpose, credibility and accountability, and its limited observable financial impact. My interpretation is that, in many cases, assurance operates as a symbolic rather than substantive governance tool. Firms may adopt limited-scope or low-quality assurance mainly to signal conformity or legitimacy, echoing findings by Boiral et al. (2019) and Michelon et al. (2019)

that assurance can serve as a communication device rather than a vehicle for genuine transparency. When assurance is narrow in scope or lacks independence, as Hummel et al. (2019) demonstrate, it fails to meaningfully reduce information asymmetry or influence investor perception.

However, in my view, the absence of significant financial effects should not be taken as evidence that all assurance is purely symbolic. Substantive sustainability initiatives: investments in clean technologies, ethical supply chains, or employee welfare, often entail high upfront costs and long payback horizons. Assurance may still play an essential societal role by validating these efforts and maintaining stakeholder confidence, even when markets do not yet reward them. From a broader perspective, this gap highlights a tension between economic and ethical value creation: society may benefit immediately from credible sustainability efforts, while financial markets lag in recognizing their worth.

Given these findings, I believe the “Green Assurance Paradox” is not a failure of SA itself but of the institutional and informational environment in which it operates. As policy frameworks such as the EU CSRD mandate standardized, high-quality assurance, the credibility premium that assurance promises could finally become visible in financial outcomes. In the meantime, firms, auditors, and regulators share a societal responsibility: to ensure that assurance evolves from symbolic compliance to a genuine instrument of accountability and trust. Only then can assurance fulfil its dual purpose, strengthening both corporate legitimacy and collective progress toward sustainability goals.

5.4 Institutional Context: Disclosure Regimes and Regional Variation

While SA shows little effect on financial outcomes, the institutional environment clearly matters. My analysis shows that the relationship between sustainability performance and market value strengthens under mandatory disclosure regimes, such as the EU Non-Financial Reporting Directive (NFRD). This means that when sustainability reporting becomes a regulatory requirement, it gains credibility and investors respond more positively.

Institutional theory helps explain this pattern. Firms are embedded in systems of rules, norms, and expectations that shape how they behave and how stakeholders interpret their actions

(Larrinaga et al., 2020). In my view, mandatory disclosure functions as a coordination device: by standardizing definitions and verification procedures, it reduces information asymmetry and enhances comparability across firms. This interpretation is consistent with Ruiz-Barbadillo and Martínez-Ferrero (2020), who show that strong investor protection and enforcement mechanisms improve the credibility of sustainability assurance, and with Reverte (2021), who finds that the NFRD increased the market's ability to price sustainability information.

By contrast, in voluntary regimes, firms retain wide discretion. As Michelon et al. (2019) demonstrate, this discretion often leads to managerial capture, and assurance and stakeholder engagement can be adopted symbolically to project legitimacy rather than to enhance accountability. My results echo that insight: when disclosure is optional, investors remain skeptical and valuation effects weaken.

The regional comparison between Nordic and Southwest European firms reinforces this institutional interpretation. Although the Nordics are often portrayed as more stakeholder-oriented, my results show no significant regional difference once mandatory reporting is introduced. This mirrors the findings of Vargas-Santander et al. (2023) and Velte (2023): institutional quality, not cultural orientation, determines whether sustainability pays off financially. In my interpretation, formal rules outweigh informal norms: regulation, assurance standards, and enforcement consistency are what convert sustainability rhetoric into measurable economic value.

From a societal standpoint, this finding is particularly relevant. It highlights that effective sustainability governance depends on institutions capable of enforcing transparency and accountability. When markets trust the information they receive, they allocate capital toward genuinely sustainable firms, rewarding responsible behavior and amplifying its positive externalities. In that sense, policy instruments such as the forthcoming CSRD are more than compliance mechanisms; they are societal infrastructure for aligning private incentives with collective welfare. As Krasodomska et al. (2024) observe, standardized assurance and regulatory oversight under the CSRD are expected to deepen stakeholder trust and strengthen the integration of sustainability into corporate value creation.

In sum, the evidence demonstrates that the financial materiality of sustainability is institutionally embedded rather than purely firm-driven. The stronger CSP–CFP relationships observed under mandatory disclosure regimes underscore the critical role of regulation in enhancing credibility. This supports institutional theory’s view that formal rules and enforcement mechanisms shape organizational behavior more effectively than voluntary initiatives. For firms, these findings suggest that compliance alone is insufficient; value creation requires substantive integration of sustainability principles. For policymakers, they highlight that robust enforcement and comparability are essential for transforming disclosure from a symbolic exercise into a driver of accountability and trust.

5.5 Broader Theoretical Implications

Looking at my findings through the three theoretical lenses used in this thesis helps explain why some relationships were weaker or stronger than expected.

My analysis shows that firms with stronger sustainability performance achieve slightly higher profitability, but no consistent market revaluation. In my view, this supports stakeholder theory (Freeman, 1984): responsible practices create internal efficiencies and strengthen relationships with employees, customers, and communities before financial markets react. Similar patterns were observed by Aftab et al. (2024) and Braam & Peeters (2018), who find that ESG initiatives enhance operational performance rather than immediate market value. From a societal standpoint, this means that sustainability creates tangible organizational benefits even when short-term profits remain modest.

Legitimacy theory helps explain the “Green Assurance Paradox”. My results show that external assurance does not strengthen the CSP–CFP link, suggesting that many companies use assurance symbolically to appear credible rather than to improve accountability. Boiral et al. (2019) and Michelon et al. (2019) reach similar conclusions: in voluntary regimes, assurance often serves as a communication tool rather than as a signal of genuine transparency. When assurance lacks depth or independence, it fails to influence stakeholder trust or financial performance. This explains why, even in my data, firms with assured reports do not perform significantly better than those without assurance.

Finally, institutional theory provides the clearest explanation for the strong effect of disclosure regulation. Once sustainability reporting becomes mandatory, as with the EU's NFRD, the CSP–CFP relationship grows stronger because rules and enforcement reduce uncertainty and signal comparability (Krasodomska et al., 2024; Reverte, 2021). This shows that institutional design, not just corporate motivation, determines whether sustainability data are trusted and valued. As the new CSRD expands coverage and introduces standardized assurance, this institutional credibility is expected to increase even further.

Taken together, my results suggest that sustainability becomes financially meaningful when stakeholder engagement builds operational value, legitimacy mechanisms preserve trust, and institutions ensure credibility. In short, substance matters more than symbolism, but institutions are what allow markets to recognize substance as value. From a societal perspective, this shows that well-designed regulation is not only about compliance, it is a collective investment in transparency and trust.

5.6 Limitations

While this study provides new insights into the financial relevance of SA and institutional context, several limitations must be acknowledged. These limitations primarily concern data availability, methodological constraints, and sample composition.

Data availability and measurement. Although the LSEG Workspace database offers standardized and comparable ESG indicators, missing observations remain a challenge, particularly for Tobin's Q and ESG controversy scores. Smaller firms and those in less transparent markets are underrepresented, which may limit the generalizability of my findings. Moreover, ESG ratings often capture disclosure quality rather than actual performance, which can weaken estimated effects.

Sample composition and generalizability. My analysis focuses on 797 large, listed firms from six European countries (Denmark, Finland, Sweden, Italy, Spain, and Portugal) from 2009 to 2023. This provides a strong institutional comparison but limits generalizability beyond Europe or to smaller enterprises. Braam & Peeters (2018) observe similar challenges in cross-country ESG

research, emphasizing that institutional and data heterogeneity restrict universal inference. Therefore, the results should be interpreted as context-specific associations, not universal laws.

Statistical power and manual coding constraints. The exploratory analysis of assurance quality dimensions (H3) is constrained by the limited size of the manually coded subsample, 37 firms and roughly 200 firm-year observations. These variables (provider type, assurance level, and coverage scope) were extracted manually from sustainability reports for 2017–2023. Due to time constraints and uneven availability of reports, expanding this sample was not feasible. Consequently, the limited number of observations reduces statistical power, resulting in large standard errors and inconclusive estimates. Future research could expand this dataset as the CSRD introduces standardized assurance disclosures, improving both sample size and comparability.

Causality and time horizons. Although two-way fixed-effects (TWFE) and lagged models mitigate endogeneity, they cannot fully eliminate reverse causality, financially successful firms may simply have more resources to improve sustainability. Moreover, ESG payoffs are likely long-term and nonlinear, a point underscored by Coelho et al. (2023) and Rahi et al. (2024), who find that sustainability investments often require multi-year horizons before measurable returns appear.

In my view, these limitations do not undermine the validity of the conclusions but instead define the boundaries of interpretation. They highlight that sustainability-finance dynamics are complex, evolving, and deeply shaped by institutions. From a societal perspective, they also underline the need for more transparent, consistent, and accessible ESG data, so that both researchers and stakeholders can evaluate corporate responsibility with greater confidence and fairness.

5.7 Practical Implications

The findings of this thesis hold practical relevance for corporate managers, investors, policymakers, and assurance providers. While the results confirm that sustainability performance has only modest financial effects and that assurance currently adds limited value, they also highlight clear directions for improvement as reporting frameworks mature.

For corporate managers. My analysis shows that sustainability should be pursued as a long-term strategic investment, not as a short-term profit lever. Firms that integrate ESG goals into daily operations and stakeholder relations achieve greater efficiency and resilience, even when markets react slowly. This aligns with evidence by Braam & Peeters (2018) that responsible practices enhance internal performance through stakeholder engagement rather than immediate valuation gains. In my view, assurance can support this process only if it is independent, broad in scope, and technically rigorous. Symbolic compliance may satisfy reporting expectations but rarely builds real trust.

For investors. Investors should interpret ESG ratings and assurance labels critically. My results, consistent with Reverte (2021) and Yao et al. (2024), show that regulated and comparable disclosures reduce information asymmetry and lower long-term risk. I believe that under the emerging CSRD environment, portfolios emphasizing transparent, assured firms will better reflect credible value creation rather than cosmetic ESG labeling.

For policymakers. My study confirms that regulation, not voluntary signaling, makes sustainability information financially meaningful. Mandatory frameworks such as the EU Non-Financial Reporting Directive (NFRD) strengthen market confidence by enforcing comparability and accountability. This finding supports Krasodomska et al. (2024), who highlight that consistent enforcement is essential for credible sustainability markets. In my view, policymakers should focus on quality assurance standards and on ensuring that compliance translates into impact, not paperwork.

For assurance providers. The results show that current voluntary assurance adds limited financial value largely because assurance quality remains inconsistent. Studies by Boiral et al. (2019) and Hummel et al. (2019) reached similar conclusions: limited-scope or low-independence engagements provide legitimacy signals but little substantive verification. Providers therefore face both a responsibility and an opportunity to professionalize their methodologies, expand sector-specific expertise, and communicate findings transparently. As the CSRD makes assurance mandatory, those who invest early in credible, standardized processes will gain an enduring advantage.

From a broader societal perspective, I believe these implications converge on a simple message: sustainability pays off when it is credible. High-quality assurance, robust regulation, and authentic managerial commitment together build the trust on which both sustainable markets and sustainable societies depend.

6 Conclusion

6.1 Revisiting the Research Question

The central aim of this thesis was to examine whether SA strengthens the relationship between CSP and CFP, and how this relationship is shaped by institutional context.

Using a panel of 797 firms across six European countries (2009–2023), my analysis shows that while sustainability performance is modestly associated with higher profitability, external assurance does not significantly enhance this link. In contrast, institutional frameworks, particularly mandatory disclosure under the EU Non-Financial Reporting Directive (NFRD), clearly amplify the connection between sustainability and financial outcomes.

My findings reveal that credibility depends more on regulation than on voluntary assurance. I term this finding the “Green Assurance Paradox”: although assurance aims to build trust in sustainability information, its financial effects remain weak without strong institutional frameworks.

Overall, the results suggest that the financial materiality of sustainability is institutionally embedded rather than firm-driven. Voluntary efforts can signal commitment, but rules and enforcement transform sustainability into measurable value.

6.2 Key Findings and Broader Meaning

Several key insights emerge from this study:

- Sustainability adds value, but mainly through operations, not speculation.

Firms with stronger sustainability performance achieve slightly higher profitability (ROA), suggesting that responsible practices improve efficiency and stakeholder relations. Yet markets

do not reward these achievements consistently in valuation (Tobin's Q), indicating that investors still struggle to quantify or trust sustainability data.

- Assurance increases visibility, not financial impact.

The "Green Assurance Paradox" demonstrates that credibility alone does not guarantee economic return. In my view, this is not a failure of assurance, but a reflection of its symbolic stage of development. Firms may use assurance to show legitimacy, while genuine accountability often requires deeper verification, time, and cost.

- Institutions make the difference.

Under mandatory disclosure regimes such as the NFRD, sustainability information becomes more credible and financially relevant. Regulation transforms sustainability from rhetoric into structure, turning voluntary virtue into enforceable practice. In my view, sustainability becomes financially meaningful only when it becomes a shared social rule.

- Assurance quality remains the missing link.

Exploratory results suggest that provider type, assurance level, and coverage scope do not consistently influence the CSP–CFP relationship. As the CSRD introduces standardized assurance, future research can assess whether quality finally transforms symbolic compliance into genuine accountability.

6.3 Theoretical and Practical Implications

This research contributes to both academic understanding and managerial practice by clarifying the conditions under which sustainability performance translates into financial value. It integrates stakeholder, legitimacy, and institutional theory to explain when sustainability efforts yield financial returns and when they do not.

From a theoretical perspective, my findings refine stakeholder theory by showing that financial benefits of sustainability arise primarily through operational and reputational efficiency, not through market revaluation. They extend legitimacy theory by demonstrating that assurance practices in weak institutional environments serve symbolic legitimacy rather than substantive transparency. Finally, they support institutional theory by evidencing that stronger formal rules, such as the NFRD's enforcement, are pivotal for translating sustainability into financial outcomes.

By combining manual assurance data and firm-level institutional indicators, this thesis also bridges methodological gaps in the sustainability–finance literature.

On a practical level, the study provides guidance to corporate managers, investors, policymakers, and assurance providers navigating Europe’s evolving reporting landscape.

For corporate managers, sustainability should be viewed as a long-term strategic investment that enhances resilience, not a short-term profit lever. Firms should focus on material ESG issues and authentic stakeholder engagement rather than symbolic assurance. When verification is pursued, it should prioritize scope, independence, and depth, ensuring assurance genuinely improves information credibility.

For investors, my analysis shows that ESG improvements signal long-term operational strength and reduced risk, even when not immediately reflected in market valuation. Investors should therefore evaluate ESG credibility through regulatory context and assurance quality rather than presence alone.

For policymakers, the findings support continued development of mandatory sustainability disclosure and standardized assurance under the CSRD. Regulation strengthens market trust, confirming that enforcement and harmonization are key to aligning sustainability with financial relevance.

For assurance providers, the study highlights a need to move beyond limited-scope reviews toward rigorous, standardized practices. In my view, methodological depth, sector expertise, and transparency are vital to transform assurance from a symbolic compliance tool into a genuine accountability mechanism.

6.4 Societal Relevance and Reflection

Beyond its academic and managerial implications, this research carries a broader societal message. The analysis shows that the credibility of sustainability is not built by firms alone but co-created by institutions, investors, regulators, and citizens. When transparency becomes a shared social expectation, anchored in law and verified through independent assurance, markets can finally distinguish between genuine commitment and symbolic compliance.

From a societal standpoint, this shift is crucial. The “Green Assurance Paradox” reveals that economic systems still reward efficiency faster than ethics, yet it also signals progress: Europe is building an institutional foundation in which responsibility becomes financially meaningful. The transition toward standardized, mandatory sustainability reporting and assurance under the CSRD is more than a regulatory reform, it represents a cultural transformation in how value and accountability are understood.

Sustainability, therefore, is not merely an accounting exercise but an ethical contract between business and society. Regulation transforms that contract into a system of trust, where verified information empowers stakeholders and reduces the space for greenwashing. As Europe moves toward assured sustainability reporting, it edges closer to an economy that values integrity alongside profit, an economy where credible disclosure supports both corporate legitimacy and collective well-being.

6.5 Recommendations

This research offers several recommendations that follow directly from my findings and reflections on credibility, regulation, and sustainability value creation.

From a research perspective, future studies should examine whether the effects of SA and performance unfold over longer horizons. My analysis suggests that operational and reputational benefits may take years to appear in financial results. Expanding the scope beyond large European firms to include small and medium-sized enterprises and non-European contexts would also enhance generalizability. Moreover, combining longitudinal data with qualitative approaches, such as interviews with assurance providers, investors, and sustainability officers could clarify how assurance influences trust, governance, and stakeholder behavior. As implementation of the CSRD advances, future research should evaluate whether standardized assurance frameworks transform symbolic compliance into genuine accountability and measurable value.

For policymakers and institutions, the results highlight that regulation remains the cornerstone of credible sustainability markets. Enforcement and harmonization are crucial for ensuring that sustainability reporting is not only mandatory but also meaningful. In my view, policymakers should focus on strengthening assurance quality, improving cross-country consistency, and

supporting smaller firms in meeting reporting and assurance requirements under the CSRD. Integrating sustainability and financial auditing standards could also enhance efficiency and coherence, while publicly disclosing assurance outcomes would foster greater societal trust.

For companies and practitioners, assurance should be treated as a strategic governance tool rather than a compliance obligation. Firms that integrate assurance into their core management systems, engaging independent and technically skilled providers, pursuing reasonable assurance levels, and learning from external feedback will not only improve transparency but also strengthen operational resilience and stakeholder relationships. In my opinion, the firms that use assurance as a mechanism for continuous improvement rather than image management will be best positioned to thrive in the new regulatory landscape.

Taken together, these recommendations underscore a broader principle: regulation, not rhetoric, determines the financial credibility of sustainability. Assurance, when symbolic, reassures the company; when substantive, it reassures society. As Europe transitions toward fully standardized, mandatory assurance, I believe the coming decade will mark a turning point. Sustainability must evolve from assured words to assured impact, from signaling responsibility to delivering measurable change. Only when markets reward truth as much as performance will business genuinely align profit with purpose.

7 References

- Aftab, J., Abid, N., Sarwar, H., Amin, A., Abedini, M., & Veneziani, M. (2024). Does corporate social responsibility drive financial performance? Exploring the significance of green innovation, green dynamic capabilities, and perceived environmental volatility. *Corporate Social Responsibility and Environmental Management*, 31(3), 1634–1653. <https://doi.org/10.1002/csr.2654>
- Aibar-Guzmán, B., Raimo, N., Vitolla, F., & García-Sánchez, I. (2024). Corporate governance and financial performance: Reframing their relationship in the context of climate change. *Corporate Social Responsibility and Environmental Management*, 31(3), 1493–1509. <https://doi.org/10.1002/csr.2649>
- Atz, U., Van Holt, T., Liu, Z. Z., & Bruno, C. C. (2023). Does sustainability generate better financial performance? Review, meta-analysis, and propositions. *Journal of Sustainable Finance &*

- Investment*, 13(1), 802–825. <https://doi.org/10.1080/20430795.2022.2106934>
- Al Frijat, Y. S., Albawwat, I. E., & Elamer, A. A. (2024). Exploring the mediating role of corporate social responsibility in the connection between board competence and corporate financial performance amidst global uncertainties. *Corporate Social Responsibility and Environmental Management*, 31(2), 1079–1095. <https://doi.org/10.1002/csr.2623>
- Al-Shaer, H., & Zaman, M. (2019). CEO Compensation and Sustainability Reporting Assurance: Evidence from the UK. *Journal of Business Ethics*, 158(1), 233–252. <https://doi.org/10.1007/s10551-017-3735-8>
- Aydoğan, E., & Kara, E. (2023). The Analysis of The Dynamic Relationship between Corporate Sustainability and Financial Performance. *Business and Economics Research Journal*, 2. <https://doi.org/10.20409/berj.2023.407>
- Boiral, O., Heras-Saizarbitoria, I., Brotherton, M.-C., & Bernard, J. (2019). Ethical Issues in the Assurance of Sustainability Reports: Perspectives from Assurance Providers. *Journal of Business Ethics*, 159(4), 1111–1125. <https://doi.org/10.1007/s10551-018-3840-3>
- Braam, G., & Peeters, R. (2018). Corporate Sustainability Performance and Assurance on Sustainability Reports: Diffusion of Accounting Practices in the Realm of Sustainable Development. *Corporate Social Responsibility and Environmental Management*, 25(2), 164–181. <https://doi.org/10.1002/csr.1447>
- Braam, G., Poutsma, E., Schouteten, R., & Heijden, B. V. D. (2024). Employee financial participation and corporate social and environmental performance: Evidence from European panel data. *British Journal of Industrial Relations*, 62(2), 381–409. <https://doi.org/10.1111/bjir.12784>
- Carey, P., Khan, A., Mihret, D. G., & Muttakin, M. B. (2021). Voluntary sustainability assurance, capital constraint and cost of debt: International evidence. *International Journal of Auditing*, 25(2), 351–372. <https://doi.org/10.1111/ijau.12223>
- Cheng, M. M., Green, W. J., & Ko, J. C. W. (2015). The Impact of Strategic Relevance and Assurance of Sustainability Indicators on Investors' Decisions. *AUDITING: A Journal of Practice & Theory*, 34(1), 131–162. <https://doi.org/10.2308/ajpt-50738>
- Christensen, H. B., Floyd, E., Liu, L. Y., & Maffett, M. (2021). The real effects of mandated

- information on social responsibility in financial reports: Evidence from mine-safety records. *Journal of Accounting and Economics*, 64(2–3), 101–138. <https://doi.org/10.1016/j.jacceco.2017.08.001>
- Cho, C. H., Michelon, G., Patten, D. M., & Roberts, R. W. (2012). CSR report assurance and the impression management perspective. *Accounting, Organizations and Society*, 37(6), 409–425.
- Coelho, R., Jayantilal, S., & Ferreira, J. J. (2023). The impact of social responsibility on corporate financial performance: A systematic literature review. *Corporate Social Responsibility and Environmental Management*, 30(4), 1535–1560. <https://doi.org/10.1002/csr.2446>
- Dhingra, K. (2023). Corporate Social Responsibility and Sustainability of Corporate Performance. *Jindal Journal of Business Research*, 12(1), 19–29. <https://doi.org/10.1177/22786821231161416>
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), <https://doi.org/10.2307/2095101>
- Dimson, E., Karakaş, O., & Li, X. (2015). Active ownership. *The Review of Financial Studies*, 28(12), 3225–3268. <https://doi.org/10.1093/rfs/hhv044>
- Fernandez-Feijoo, B., Romero, S., & Ruiz, S. (2015). Multilevel Approach to Sustainability Report Assurance Decisions. *Australian Accounting Review*, 25(4), 346–358. <https://doi.org/10.1111/auar.12104>
- Fiss, P. C., & Zajac, E. J. (2004). The diffusion of ideas over contested terrain: The (non)adoption of a shareholder value orientation among German firms. *Administrative Science Quarterly*, 49(4), 501–534. <https://doi.org/10.2307/4131489>
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.
- Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210–233. <https://doi.org/10.1080/20430795.2015.1118917>
- García-Sánchez, I., Aibar-Guzmán, B., Aibar-Guzmán, C., & Azevedo, T. (2020). CEO ability and sustainability disclosures: The mediating effect of corporate social responsibility performance. *Corporate Social Responsibility and Environmental Management*, 27(4), 1565–1577.

<https://doi.org/10.1002/csr.1905>

García-Sánchez, I., Hussain, N., Martínez-Ferrero, J., & Ruiz-Barbadillo, E. (2019). Impact of disclosure and assurance quality of corporate sustainability reports on access to finance. *Corporate Social Responsibility and Environmental Management*, 26(4), 832–848.

<https://doi.org/10.1002/csr.1724>

Gillet-Monjarret, C. (2015). Assurance of Sustainability Information: A Study of Media Pressure. *Accounting in Europe*, 12(1), 87–105. <https://doi.org/10.1080/17449480.2015.1036894>

Gjøølberg, M. (2009). Measuring the immeasurable? Constructing an index of CSR practices and CSR performance in 20 countries. *Scandinavian Journal of Management*, 25(1), 10–22.

<https://doi.org/10.1016/j.scaman.2008.10.003>

Gjøølberg, M. (2009). The origin of corporate social responsibility: Global forces or national legacies? *Socio-Economic Review*, 7(4), 605–637. <https://doi.org/10.1093/ser/mwp017>

Hall, P. A., & Soskice, D. (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford University Press.

<https://doi.org/10.1093/0199247757.001.0001>

Hummel, K., Schlick, C., & Fifka, M. (2019). The Role of Sustainability Performance and Accounting Assurors in Sustainability Assurance Engagements. *Journal of Business Ethics*, 154(3), 733–757.

<https://doi.org/10.1007/s10551-016-3410-5>

Ioannou, I., & Serafeim, G. (2017). The consequences of mandatory corporate sustainability reporting. *Harvard Business School Research Working Paper*, No. 11-100.

DOI: [10.2139/ssrn.1799589](https://doi.org/10.2139/ssrn.1799589)

Jackson, G., & Apostolakou, A. (2010). Corporate social responsibility in Western Europe: An institutional mirror or substitute? *Journal of Business Ethics*, 94(3), 371–394.

<https://doi.org/10.1007/s10551-009-0269-8>

Jadoon, I. A., Ali, A., Ayub, U., Tahir, M., & Mumtaz, R. (2021). The impact of sustainability reporting quality on the value relevance of corporate sustainability performance. *Sustainable Development*, 29(1), 155–175. <https://doi.org/10.1002/sd.2138>

Junior, R. M., Best, P. J., & Cotter, J. (2014). Sustainability Reporting and Assurance: A Historical Analysis on a World-Wide Phenomenon. *Journal of Business Ethics*, 120(1), 1–11.

<https://doi.org/10.1007/s10551-013-1637-y>

- Krasodomska, J., Zarzycka, E., & Zieniuk, P. (2024). Voluntary sustainability reporting assurance in the European Union before the advent of the corporate sustainability reporting directive: The country and firm-level impact of Sustainable Development Goals. *Sustainable Development*, 32(3), 1652–1664. <https://doi.org/10.1002/sd.2744>
- Larrinaga, C., Rossi, A., Luque-Vilchez, M., & Núñez-Nickel, M. (2020). Institutionalization of the Contents of Sustainability Assurance Services: A Comparison Between Italy and United States. *Journal of Business Ethics*, 163(1), 67–83. <https://doi.org/10.1007/s10551-018-4014-z>
- Lee, S. P., & Isa, M. (2024). Corporate sustainability practices and financial performance: The moderating role of corporate controversies and Shariah screening. *Corporate Social Responsibility and Environmental Management*, 31(4), 3651–3667. <https://doi.org/10.1002/csr.2763>
- Lee, S. W. A., Rodrigs, M., Nathan, T. M., Rashid, M. A., & Al-Mamun, A. (2023). The Relationship Between the Quality of Sustainability Reporting and Corporate Financial Performance: A Cross-Sectional and Longitudinal Study. *Australasian Business, Accounting and Finance Journal*, 17(2), 38–60. <https://doi.org/10.14453/aabfj.v17i2.04>
- Lei, X., & Yu, J. (2024). Striving for sustainable development: Green financial policy, institutional investors, and corporate ESG performance. *Corporate Social Responsibility and Environmental Management*, 31(2), 1177–1202. <https://doi.org/10.1002/csr.2630>
- Licandro, O., Burguete, J. L. V., Ortigueira-Sánchez, L. C., & Correa, P. (2024). Corporate Social Responsibility and Financial Performance: A Relationship Mediated by Stakeholder Satisfaction. *Administrative Sciences*, 14(1), 15. <https://doi.org/10.3390/admsci14010015>
- Manetti, G., & Becatti, L. (2009). Assurance Services for Sustainability Reports: Standards and Empirical Evidence. *Journal of Business Ethics*, 87(S1), 289–298. <https://doi.org/10.1007/s10551-008-9809-x>
- Manetti, G., & Toccafondi, S. (2012). The Role of Stakeholders in Sustainability Reporting Assurance. *Journal of Business Ethics*, 107(3), 363–377. <https://doi.org/10.1007/s10551-011-1044-1>
- Manning, B., Braam, G., & Reimsbach, D. (2019). Corporate governance and sustainable business

- conduct—Effects of board monitoring effectiveness and stakeholder engagement on corporate sustainability performance and disclosure choices. *Corporate Social Responsibility and Environmental Management*, 26(2), 351–366. <https://doi.org/10.1002/csr.1687>
- Martínez-Ferrero, J., & García-Sánchez, I. (2017). Sustainability assurance and cost of capital: Does assurance impact on credibility of corporate social responsibility information? *Business Ethics: A European Review*, 26(3), 223–239. <https://doi.org/10.1111/beer.12152>
- Martínez-Ferrero, J., & García-Sánchez, I.-M. (2018). The Level of Sustainability Assurance: The Effects of Brand Reputation and Industry Specialisation of Assurance Providers. *Journal of Business Ethics*, 150(4), 971–990. <https://doi.org/10.1007/s10551-016-3159-x>
- Michelon, G., Patten, D. M., & Romi, A. M. (2019). Creating Legitimacy for Sustainability Assurance Practices: Evidence from Sustainability Restatements. *European Accounting Review*, 28(2), 395–422. <https://doi.org/10.1080/09638180.2018.1469424>
- Rahi, A. F., Johansson, J., Blomkvist, M., & Hartwig, F. (2024). Corporate sustainability and financial performance: A hybrid literature review. *Corporate Social Responsibility and Environmental Management*, 31(2), 801–815. <https://doi.org/10.1002/csr.2600>
- Reimsbach, D., Hahn, R., & Gürtürk, A. (2018). Integrated Reporting and Assurance of Sustainability Information: An Experimental Study on Professional Investors' Information Processing. *European Accounting Review*, 27(3), 559–581. <https://doi.org/10.1080/09638180.2016.1273787>
- Reverte, C. (2021). Do investors value the voluntary assurance of sustainability information? Evidence from the Spanish stock market. *Sustainable Development*, 29(5), 793–809. <https://doi.org/10.1002/sd.2157>
- Robles-Elorza, D., San-Jose, L., & Urionabarrenetxea, S. (2023). Deep-diving into the relationship between Corporate Social Performance and Corporate Financial Performance—A comprehensive investigation of previous research. *European Research on Management and Business Economics*, 29(2), 100209. <https://doi.org/10.1016/j.iedeen.2022.100209>
- Ruiz-Barbadillo, E., & Martínez-Ferrero, J. (2020). What impact do countries have on levels of sustainability assurance? A complementary-substitutive perspective. *Corporate Social Responsibility and Environmental Management*, 27(5), 2329–2341.

<https://doi.org/10.1002/csr.1967>

Sabirali, K. P., & Mahalakshmi, S. (2023). Corporate Sustainability Practices: A Systematic Literature Review and Bibliometric Analysis. *Vision: The Journal of Business Perspective*, 09722629231203125. <https://doi.org/10.1177/09722629231203125>

Seguí-Mas, E., Bolas-Araya, H., & Polo-Garrido, F. (2015). SUSTAINABILITY ASSURANCE ON THE BIGGEST COOPERATIVES OF THE WORLD: AN ANALYSIS OF THEIR ADOPTION AND QUALITY. *Annals of Public and Cooperative Economics*, 86(2), 363–383. <https://doi.org/10.1111/apce.12073>

Soriano, L., & Fong, C. (2023). TOWARD THE END OF THE CORPORATE SOCIAL PERFORMANCE – CORPORATE FINANCIAL PERFORMANCE DEBATE. *Business: Theory and Practice*, 24(2), 416–424. <https://doi.org/10.3846/btp.2023.16688>

Steinmeier, M., & Stich, M. (2019). Does Sustainability Assurance Improve Managerial Investment Decisions? *European Accounting Review*, 28(1), 177–209. <https://doi.org/10.1080/09638180.2017.1412337>

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571–610. <https://doi.org/10.2307/258788>

Taher, A. (2023). Do corporate values have value? The impact of corporate values on financial performance. *Future Business Journal*, 9(1), 76. <https://doi.org/10.1186/s43093-023-00254-9>

Teng, X., Wang, S., Liu, H., Sun, W., Zhu, D., & Wu, K.-S. (2024). Too Much of a Good Thing? Two-Sided Effect of ESG on Corporate Financial Performance. *Engineering Economics*, 35(4), 487–503. <https://doi.org/10.5755/j01.ee.35.4.33729>

Vargas-Santander, K. G., Álvarez-Diez, S., Baixauli-Soler, S., & Belda-Ruiz, M. (2023). Corporate social responsibility and financial performance: Does country sustainability matter? *Corporate Social Responsibility and Environmental Management*, 30(6), 3075–3094. <https://doi.org/10.1002/csr.2539>

Velte, P. (2023). Sustainable institutional investors, corporate sustainability performance, and corporate tax avoidance: Empirical evidence for the European capital market. *Corporate Social Responsibility and Environmental Management*, 30(5), 2406–2418. <https://doi.org/10.1002/csr.2492>

Weinmayer, K., Garaus, M., & Wagner, U. (2024). The impact of corporate sustainability performance on advertising efficiency. *OR Spectrum*, 46(1), 175–209. <https://doi.org/10.1007/s00291-023-00717-z>

Yao, N., Ouyang, Z., Guo, Q., & Gong, X. (2024). Quality or breadth? Environmental information disclosure, corporate financial performance and the role of analysts. *Business Ethics, the Environment & Responsibility*, 33(3), 431–448. <https://doi.org/10.1111/beer.12615>

8 Appendices

8.1 Appendix A. Variable definitions and data sources

The table below summarizes the key variables used in the study, including their operational definitions, type, and data sources.

Variable	Definition / Measurement	Type	Source
ESG Score (CSP)	Composite ESG score (0–100)	Continuous	LSEG Workspace
ESG Comb	Composite ESG score (0–100)	Continuous	LSEG Workspace
Environmental Score	ESG subscore: emissions, resource use, innovation	Continuous	LSEG Workspace
Social Score	ESG subscore: workforce, community, human rights	Continuous	LSEG Workspace
Governance Score	ESG subscore: board structure, audit, shareholder rights	Continuous	LSEG Workspace
CSP_Dummy	1 = CSP above industry median; 0 = otherwise	Dummy	Constructed from LSEG Workspace

ROA	Return on Assets = Net income / Total assets	Continuous	LSEG Workspace
Tobin's Q	Market value of assets / replacement cost	Continuous	LSEG Workspace
Sustainability Assurance (SA)	1 = ESG report assured by third party; 0 = no assurance	Dummy	LSEG Workspace
SA_Provider	1 = Big 4; 0 = Non-Big 4	Dummy	Manual coding
SA_Level	1 = Reasonable assurance; 0 = Limited assurance	Dummy	Manual coding
SA_Coverage	1 = Full report assurance; 0 = Partial KPIs only	Dummy	Manual coding
Disclosure_Regime	1 = Mandatory disclosure (post-NFRD); 0 = Voluntary	Dummy	EU NFRD, national policy docs
Institutional_Orientation	1 = Stakeholder- oriented; 0 = Shareholder-oriented	Dummy	Institutional theory classification
Firm_Size	Log of total assets	Continuous	LSEG Workspace
Leverage	Total liabilities / total assets	Continuous	LSEG Workspace
Capital_Intensity	Fixed assets / total assets	Continuous	LSEG Workspace
Board_Independence	Proportion of independent directors	Continuous	BoardEx
Ownership_Concentration	Top 3 shareholders' combined stake	Continuous	BoardEx
Rule_of_Law; Control of Corruption; Government Effectiveness	Country-level governance indicator	Continuous	World Bank WGI

8.2 Appendix B. Descriptive Statistics and Diagnostics

TABLE 2. VARIANCE INFLATION FACTORS (VIF)

Variable	VIF	1/VIF	Interpretation
Firm Size (ln_assets)	1.23	0.813	No concern
Ownership Top 3	1.11	0.901	No concern
Board Independence	1.11	0.902	No concern
ESG Controversy (esgcont)	1.16	0.863	No concern
Leverage	1.06	0.944	No concern
Fixed Assets/Equity	1.05	0.952	No concern
Capex/Assets (capex_to_assets_c)	1.03	0.974	No concern
Mean VIF	1.11		No multicollinearity

Notes: VIF (Variance Inflation Factor) values measure multicollinearity among independent variables. All VIF values are substantially below the conventional threshold of 5.0 (and even below the more stringent threshold of 2.5), indicating no significant multicollinearity concerns. The highest VIF is 1.23 for firm size (ln_assets), suggesting that only 23% of its variance is explained by other predictors, well within acceptable limits. These low VIF values ensure that individual coefficient estimates are stable and interpretable. *Source:* Author calculations.

TABLE 3. VARIANCE DECOMPOSITION OF ESG VARIABLES

Variable	N	Total Variance	Between Variance (%)	Within Variance (%)
ESG Controversy (esgcont)	5,304	326.81	36.6	63.4
Governance Score (gov)	5,285	462.62	71.7	28.3
ESG Combined (esgcomb)	5,304	420.63	77.0	23.0
Social Score (soc)	5,283	591.74	79.3	20.7
ESG Score (esg)	5,283	521.45	82.1	17.9
ESG Score (esg_score)	5,304	368.42	83.7	16.3
Environmental Score (env)	5,283	712.15	84.9	15.1

Notes: Variance decomposition shows the proportion of total variation attributable to between-firm differences versus within-firm changes over time. Higher within-firm variation indicates greater temporal changes and better suitability for fixed effects estimation. *Source:* Author calculations.

8.3 Appendix C. Robustness

TABLE 12. H4: DISCLOSURE REGIME MODERATION (ESG_SCORE × NFRD) ROBUSTNESS: LSDV-TWFE

	TWFE: Tobin's Q	TWFE: ROA
esg_score	-0.004 (0.004)	0.015 (0.033)
disclosure_regime_custom	-0.653** (0.257)	0.905 (2.550)
ln_assets_c	-0.390** (0.158)	0.330 (1.408)
leverage_c	-0.011** (0.005)	-0.194*** (0.029)
capex_to_assets_c	0.040*** (0.010)	0.149 (0.154)
fixed_assets_to_equity_c	-0.000 (0.000)	-0.001** (0.000)
board_independent	-0.001 (0.004)	-0.005 (0.021)
ownership_top3_c	-0.008 (0.010)	-0.101 (0.084)
esg_score:disclosure_regime_custom	0.010*** (0.004)	0.002 (0.035)
R ²	0.104	0.104
Adj. R ²	-0.060	-0.061
Num. obs.	1317	1316

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Notes: *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author's own RStudio output (2025).

TABLE 13. ROBUSTNESS: LAGGED ESG (ENDOGENEITY CHECK)

	Contemporaneous	Lagged t-1
esgcont	0.001 (0.001)	
ln_assets_c	-0.325** (0.160)	-0.404** (0.184)
leverage_c	-0.012** (0.005)	-0.011** (0.005)
capex_to_assets_c	0.038*** (0.010)	0.052*** (0.014)
fixed_assets_to_equity_c	-0.000 (0.000)	-0.000 (0.000)
board_independent	0.001 (0.004)	-0.003 (0.004)
ownership_top3_c	-0.012 (0.012)	-0.013 (0.016)
lag(esgcont, 1)		0.000 (0.002)
R ²	0.091	0.115
Adj. R ²	-0.080	-0.070
Num. obs.	1272	1150

***p < 0.01; **p < 0.05; *p < 0.1

Notes: Lagged models control for firm and year fixed effects. The insignificant lagged ESG coefficient suggests no delayed effect of CSP on financial performance, supporting the robustness of the main findings.
Source: Author's own RStudio output (2025).

TABLE 14. ROBUSTNESS: ALTERNATIVE ESG MEASURES (TWFE ONLY)

	esg_score (TWFE)	esg (TWFE)	esgcomb (TWFE)	env (TWFE)	soc (TWFE)	gov (TWFE)
esg_score	0.000 (0.004)					
ln_assets_c	-0.363**	-0.331**	-0.334**	-0.354**	-0.326**	-0.326**

	esg_score	esg	esgcomb	env	soc	gov
	(TWFE)	(TWFE)	(TWFE)	(TWFE)	(TWFE)	(TWFE)
	(0.159)	(0.164)	(0.165)	(0.165)	(0.161)	(0.162)
leverage_c	-0.011**	-0.012**	-0.012**	-0.011**	-0.012**	-0.012**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
capex_to_assets_c	0.041***	0.038***	0.038***	0.038***	0.039***	0.039***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)
fixed_assets_to_equity_c	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
board_independent	-0.000	0.001	0.000	0.000	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
ownership_top3_c	-0.009	-0.012	-0.012	-0.012	-0.012	-0.012
	(0.010)	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)
esg		0.001				
		(0.004)				
esgcomb			0.002			
			(0.004)			
env				0.005		
				(0.004)		
soc					0.000	
					(0.003)	
gov						-0.000
						(0.002)
R ²	0.096	0.091	0.092	0.096	0.091	0.091
Adj. R ²	-0.068	-0.081	-0.080	-0.075	-0.081	-0.081
Num. obs.	1317	1272	1272	1270	1270	1270

*** p < 0.01; ** p < 0.05; * p < 0.1

Notes: All models include firm and year fixed effects. Alternative ESG specifications (overall, combined, and individual pillar measures) yield consistent and statistically insignificant coefficients, indicating that within-firm changes in sustainability performance do not translate into financial gains. Control variables remain stable and significant across models, confirming robustness. These findings suggest that the CSP–CFP relationship is primarily cross-sectional rather than time-varying. *Source:* Author’s own RStudio output (2025).

8.4 Appendix D. Use of Generative AI Tools

This appendix fulfills the requirement to document the use of Generative AI (GenAI) tools as stated in the MTHEC 2024–2025 Thesis Guidelines.

1. Statement of Purpose

Generative AI tools were used in a limited and transparent way to support coding, data analysis, and minor language refinement. All outputs were critically reviewed, verified, and where necessary modified by the author to ensure accuracy and integrity.

2. Tools used:

- Tool: ChatGPT (GPT-3.5 and GPT-4o, OpenAI)
- Access mode: ChatGPT web interface (no plug-ins or external data uploads)

3. Scope of use:

- 1) Coding and Data Analysis Assistance: ChatGPT was consulted to debug and optimize R code for panel-data regressions (fixed-effects models, interaction terms, robustness checks). It also helped clarify the interpretation of statistical outputs. All analyses were executed and validated independently by the author (Chapters 3 and 4).
- 2) Writing and Grammar Refinement: ChatGPT was used for minor phrasing and stylistic improvements to enhance academic clarity and consistency, mainly in Chapters 3, 5, and 6. All substantive arguments, theoretical reasoning, and empirical interpretations were written by the author.

4. Critical evaluation and reflection.

All GenAI suggestions were checked for correctness and relevance before inclusion. No AI tool was used to generate data, literature sources, or conceptual content. The author takes full responsibility for all results, interpretations, and written content.

Reflection: Using ChatGPT improved efficiency in coding and writing, particularly in error detection and concise phrasing. It also enhanced the author’s understanding of R syntax and econometric model diagnostics by providing quick illustrative examples that were manually adapted.

5. Example interactions.

- Query: “R code to test variance-inflation factors (VIF) for a fixed-effects model.”

Use: Adapted snippet provided; verified results with `car::vif()` in R.

- Query: “Rephrase: ‘The model controls for firm and year effects to reduce omitted variable bias.’”

Use: AI suggestion accepted after minor stylistic editing.

No AI tool was used to generate empirical data, literature sources, or conceptual content. All GenAI outputs were carefully reviewed, fact-checked, and verified by the author. All statistical results were independently verified and interpreted by the author. The author takes full responsibility for the accuracy, validity, and integrity of all content in this thesis.