



The Effect of Financial Performance on ESG Performance in European listed companies: Board Characteristics as a Moderator

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ABSTRACT

This paper focuses on how the financial performance affects ESG performance among European-based listed companies, where board characteristics provide a moderating role. The study is based on Agency Theory, Stakeholder Theory and the Resource-Based View to state that financially endow firms have the resources and flexibility to undertake sustainability projects. ESG performance is measured based on Refinitiv composite and pillar scores using panel data on 600 firms operating in Europe in 2010-2023, whereas financial performance is proxied by ROA, Net Profit Margin, and the gender diversity of boards. As moderating variables, board size, independence of the board, and gender diversity amongst the boards are also looked at. The panel regressions which are fixed-effects are used to address the firm-level heterogeneity and time effects. As shown by its results, financial performance affects ESG performance to a lesser but somewhat considerable extent, especially in terms of profitability. The relationship between the financial performance and ESG engagement is enhanced by board size, whereas there is no substantial moderating role of board independence. The findings enhance the current body of research on the financial sustainability nexus by shedding light on the directional connection and emphasizing the governance circumstances within which financial strength is converted into sustainability performance.

Keywords: Financial Performance; ESG Performance; Board Characteristics; Corporate Governance; Moderation; European Firms.

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1. Introduction

With the last ten years, the Environmental, Social, and Governance (ESG) performance turned into a strategic focus of the European capital markets at the same time, the voluntary corporate reporting practice became a thing of the past. Sustainability reporting has been institutionalized and is growing in regulatory pressure, which has profoundly transformed corporate disclosure models (Chen et al., 2023; Daugaard and Ding, 2022). ELS metrics are actively integrated into investments, risk assessment frameworks and long-term valuation frameworks in Europe especially (Friede, Busch, and Bassen, 2015). Consequently, ESG performance is no longer considered as a fringe reputational instrument but as a factor in corporate sustainability and corporate positioning.

The future of the interconnection between financial performance and ESG performance is both theoretically and empirically debated even though the centrality of the ESG considerations is now increasing. There is a big body of research that examines the question of whether ESG engagement is better at enhancing financial performance (Chen et al., 2023; Shaikh, 2022; X. Yu and Xiao, 2022). Nevertheless, there is another and no less significant point of view, which claims that ESG engagement is a result of financial performance. Under this perspective, financially health companies have the internal capabilities and management flexibility to make sustainability investments without compromising the short-term performance (Coelho, Jayantilal, and Ferreira, 2023; Okafor, Adeleye, and Adusei, 2021).

Hypothetically, Agency Theory, Stakeholder Theory and the Resource-Based View (RBV) support this position. According to Agency Theory, strong management and financial power will minimize short-termism of managers and enable corporations to invest resources in long-term strategic projects like ESG investments (Jensen and Meckling, 1976; Adams and Ferreira, 2009). The Stakeholder Theory assumes that companies that have enough financial resources can have an advantage when it comes to addressing the demands of the stakeholders, such as environmental responsibility, social interaction, and transparency in the governance (Zhang, 2020; Barauskaite and Streimikiene, 2021). In the meantime, RBV stresses that financial resources are strategic assets that help firms to develop sustainable competitive advantages with the help of ESG innovation and responsible practices (Rahi et al., 2024; Coelho et al., 2023).

Financial ability is however not always the direct result to better ESG performance. Board characteristics and other corporate governance mechanisms are significant in influencing strategic decisions of resources allocation. Board of directors predetermines the allocation of financial surpluses and the significance of sustainability initiatives (Endrikat et al., 2021; Pucheta-Martínez and Gallego-Álvarez, 2020). The size of the board of directors can make it more diverse in terms of expertise and strategic discussion, the independence of the board can make it better at monitoring activities, and gender diversity in the board can make it more sensitive to the interests of stakeholders and ethical issues (Adams and Ferreira, 2009; Terjesen et al., 2016; Safiullah et al., 2022). There is empirical evidence that the relationship between sustainability engagement and firm performance may be moderated by governance structures (Rossi et al., 2021; Chouaibi et al., 2021; Sharawi, 2024), but little research has been conducted that explains the relationship between board characteristics and the effect of financial performance on ESG performance within a European context.

Despite the fact that the nexus between ESG and financial performance has already been investigated (Friede et al., 2015; Skaperas, 2023), there are two notable gaps. To begin with, a significant amount of literature concentrates on the impact of ESG on the financial performance and not the opposite directional relationship. Second, empirical studies regarding the moderating effect of board characteristics in the translation of financial strength into ESG engagement are limited, especially when longitudinal panel data of large European listed companies is used.

To fill these gaps, this paper examines how the financial performance of firms that are listed on the STOXX Europe 600 index also affects the ESG performance during the years 2010-2023. More so, it looks at how board size, board independence, and gender diversity in terms of board gender modulate this relationship. Through the use of two-way fixed-effects panel regressions, the paper removes firm-specific heterogeneity and time-effects to give strong evidence of the connection between finance and sustainability in the European capital markets.

This study fulfills the purpose of the literature in three aspects. First, it outlines the directional relationship between the financial and ESG performance by placing financial prowess as a possible precursor of sustainability participation. Second, it incorporates board features as governance systems that predispose this association. Third, it offers extensive European panel evidence since the time of significant regulatory and institutional ESG progress (Chen et al., 2023; Daugaard and Ding, 2022).

The rest of the paper follows in the following manner. Section 2 works out the theoretical framework and hypotheses. Section 3 has the research design and methodology. The results of the empirical analysis are reported in Section 4. The findings and their implications have been discussed in Section 5. This paper ends with Section 6 that expresses future research opportunities.

2. Problem Statement Research Questions

The rapid institutionalization of the ESG reporting in the capital markets of Europe has caused the paradigm shift in the realm of corporate performances. The regulatory changes, the increased interest of stakeholders in the companies, and the fact that the sustainability metrics are included in the investment decisions have aggravated the pressure on companies to enhance their ESG performance (Chen et al., 2023; Daugaard and Ding, 2022). Even though this has evolved, much remains unclear with regard to the economic incentive in the ESG engagement.

Among the existing bodies of literature, the issue concerning the strengthening of the performance of the ESG by the financial performance are tackled (Friede, Busch, and Bassen, 2015; Shaikh, 2022; X. Yu and Xiao, 2022). Compared to this, there has been a relatively lower emphasis on the reverse causal direction of whether, financial performance enables firms to attain higher levels of ESG performance, as a comparison. This omission has a theoretical significance. In the framework of Resource-Based View, financial resources may be regarded as strategic resources that are capable of assisting companies in investing in long-term sustainability initiatives (Coelho et al., 2023; Rahi et al., 2024). Similarly, Stakeholder Theory means that the rising environmental and social expectations can be addressed more effectively by financially healthy companies (Barauskaite and Streimikiene, 2021; Zhang, 2020). Nonetheless, there is no empirical evidence on this directional relationship that is conclusive and instead apocalyptic (Skaperas, 2023).

Furthermore, whereas financial mightiness provides the power to make ESG investment, the transformation of the financial resources to sustainability could depend on the governing process. The boards of directors are mainly relied on in strategic decisions, allocation of resources, and managerial control (Endrikat et al., 2021; Pucheta-Martínez and Gallego-Alvarez, 2020). The past research confirms that the corporate social responsibility and financial performance depend on the board attributes (Rossi et al., 2021; Chouaibi et al., 2021; Sharawi, 2024). However, empirical literature on the board structure as a predictor of the impact of financial performance on the ESG performance among European listed companies is scanty.

This is particularly critical in the European market where the level of both the ESG regulation and disclosure principles has increased over the past ten years. The absence of clear evidence on whether financially better companies in a systematic way actualize the high-quality ESG outcomes and under what conditions it depends on the policymakers, investors and corporations' decision-makers.

In this respect, it happens that the gap that will be addressed in the current research is the absence of clear empirical evidence on:

1. Whether financial performance significantly influences ESG performance in European listed companies;
2. Whether board characteristics moderate this relationship;
3. Whether different dimensions of financial performance (profitability and market-based valuation) exert heterogeneous effects on ESG outcomes.

By addressing these issues using longitudinal panel data from STOXX Europe 600 firms, this study seeks to clarify the financial determinants of ESG performance and identify the governance mechanisms that enhance or constrain this relationship.

3. Theoretical Framework and Hypotheses Development

3.1 Financial Performance as a Strategic Antecedent of ESG Performance

Financial performance and ESG engagement have been traditionally explored considering the view of a sustainability initiative as one that promotes firm performance (Friede, Busch, and Bassen, 2015; Shaikh, 2022). But the causal direction in the other way whether ESG performance is possible due to financial performance is a relatively understudied topic especially in a longitudinal European context.

Financial capital is considered an essential resource in a perspective like the Resource-Based View (RBV) which makes it possible to take long-term investment and innovation (Coelho, Jayantilal, and Ferreira, 2023). ESG programs like carbon cutting technologies, employee welfare, systemic restructuring of governance, and system of compliance are of high cost. Companies that are more profit-driven and those that have a stable price in the market have the ability to absorb such expenses without compromising business sustainability. Therefore, sustainability engagement may be facilitated by financial performance.

To supplement RBV, the Stakeholder Theory argues that companies exist in a system of stakeholder relations that require responsible corporate attitude (Barauskaite and Streimikiene, 2021; Zhang, 2020). But, the responsiveness to the requests of stakeholders is resource contingent. Firms that have limited finances might give more priority on liquidity saving and survival in the short run than on ESG investments. Conversely, well-endowed companies are able to invest in environmental and social responsibilities and still stay afloat.

Moreover, there is another governance-based explanation that is offered by Agency Theory (Jensen and Meckling, 1976). As companies demonstrate good financial results, there is more discretion of the managers. This is discretion that may be channeled to opportunistic behavior or channeled to long term value creation such as the ESG initiatives. Financial strength under good governance conditions could minimize the agency conflict and contribute to the sustainability-based strategic decision-making (Adams and Ferreira, 2009).

Even with these theoretical arguments, there are mixed findings in the form of empirical findings. There is some indication that ESG and financial performance are trade-offs in some circumstances (Skaperas, 2023), and there are also studies that record positive correlations (Chen et al., 2023). Nonetheless, existing research has limited study exclusively modeling financial performance as a precursor of ESG performance with the use of firm level panel data.

Based on the above theoretical mechanisms, this study conceptualizes financial performance as an impetus of ESG engagement.

Accordingly:

H1: Financial performance positively affects ESG performance in European listed companies.

In order to narrow down this forecast, financial performance is decomposed into the accounting-based and market-based dimensions.

Profitability in terms of accounting (e.g. ROA, Net Profit Margin) indicates the efficiency of operations and generation of internal resources. Increasing profitability is a direct proportionality to the rise in discretionary financial capacity to invest in ESG activities.

H1a: Profitability positively affects ESG performance.

Market-based performance (Q of Tobin) reflects the future growth and risk expectations of the investors. The companies, which are more valued in the market, might have more pressure to assume the sustainability levels and indicate the long-term strategic intentions of the organization.

H1b: Market-based financial performance positively affects ESG performance.

3.2 Governance as a Conditioning Mechanism: The Moderating Role of Board Characteristics

Financial performance can provide the resources required to act as an ESG investor but being able to have resources does not necessarily translate to being engaged in sustainability. The correlation of financial strengths with the ESG results requires corporate governance frameworks.

Boards of directors are more involved in strategic control, control of management, and consenting to the significant investment (Endrikat et al., 2021; Pucheta-Martínez and Gallego-Álvarez, 2020). The nature of governance mechanisms is what determines the extent to which excess financial resources are used in long term sustainability projects or elsewhere.

Agency Theory Board effectiveness Agency Theory reduces the short-termism that is inherent in the management and ensures that the strategic decisions made are consistent with long-term value addition. As such, board characteristics can either enhance or undermine the effect of financial performance on the ESG performance.

Board Size

The larger boards can increase the diversity of expertise, representatives of stakeholders, and the ability to engage in strategic debate. It may be that this diversity will bring more awareness to sustainability factors and enhance the strategic use of financial resources in ESG activities. The existing evidence indicates that CSR engagement and the quality of governance depend on the board composition (Rossi et al., 2021; Chouaibi et al., 2021).

Thus:

H2a: Board size positively moderates the relationship between financial performance and ESG performance, such that the positive effect of financial performance on ESG performance is stronger in firms with larger boards.

Board Independence

It is assumed that independent directors would increase the quality of monitoring and minimize the managerial opportunism (Adams and Ferreira, 2009). Theoretically, increased board independence can promote investments that are long-term in nature since it eliminates short-term performance pressure. Nonetheless, the independent directors can also become risk-averse thereby limiting discretionary ESG investments. With these conflicting theoretical anticipations, the direction that is moderating is considered empirically.

H2b: Board independence moderates the relationship between financial performance and ESG performance.

Board Gender Diversity

Gender diversified boards were also linked to a wider sensitivity to stakeholders, ethical responsiveness, and CSR improvement (Terjesen, Sealy, and Singh, 2016; Safiullah et al., 2022). The increased diversity might augment the probability of financial resources being strategically directed to ESG activities instead of temporary financial dispensation.

Therefore:

H2c: Board gender diversity positively moderates the relationship between financial performance and ESG performance.

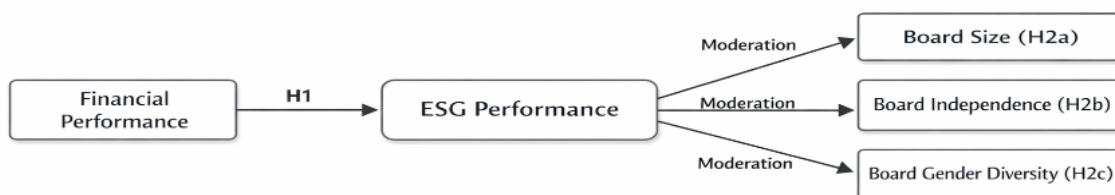


Figure 1: Conceptual Framework

4. Previous Studies

(Rossi et al., 2021) Does a board characteristic moderate the relationship between CSR practices and financial performance? Evidence from European ESG firms.

This study investigates the impact of corporate social responsibility (CSR) practices on the financial performance of ESG firms, with a particular focus on the moderating role of board characteristics. Using a quantitative methodology, the research analyzed panel data from 225 European listed companies between 2015 and 2019, sourced from the Thomson Reuters ASSET4 database, and applied linear regression models to examine both the direct and moderating effects. The results indicate that CSR practices positively influence financial performance and that board characteristics partially moderate this relationship, highlighting the importance of governance structures in enhancing the effectiveness of CSR initiatives. Based on these findings, the study recommends that policymakers and regulators strengthen corporate governance mechanisms and that firms strategically structure their boards to support CSR initiatives, ensuring that these practices contribute effectively to improved financial outcomes.

Chouaibi et al., (2021). Does a Board Characteristic Moderate the Relationship between CSR Practices and Financial Performance? Evidence from European ESG Firms.

This study examines the relationship between corporate social responsibility (CSR) practices and financial performance in ESG firms, with a focus on the moderating role of board characteristics. Using a quantitative methodology, the research analyzed panel data from 225 European listed companies between 2015 and 2019, sourced from the Thomson Reuters ASSET4 database, and applied linear regression models to test the hypothesized relationships. The results reveal that CSR practices positively influence financial performance and that board characteristics partially moderate this relationship, demonstrating the importance of governance structures in maximizing the benefits of CSR initiatives. Based on these findings, the study recommends that policymakers and regulators enhance corporate governance mechanisms and that firms design their boards strategically to support CSR practices, thereby improving both governance quality and financial outcomes.

Sharawi, (2024). The moderating effect of board characteristics in the relationship between ESG disclosure and financial performance.

This study examines the relationship between environmental, social, and governance (ESG) disclosures and financial performance in Saudi-listed companies, emphasizing the moderating role of board characteristics. Using a quantitative approach, the research analyzed financial data and ESG disclosures to assess their impact on key financial performance indicators, including Return on Assets (ROA), Return on Equity (ROE), and Earnings Per Share (EPS). The results indicate a positive association between overall ESG disclosures and financial performance, with environmental disclosures enhancing ROA, social disclosures improving ROE, and governance disclosures boosting EPS. Furthermore, board characteristics such as ownership, size, and independence moderate these effects, with board ownership having a consistently positive impact. Based on these findings, the study recommends that companies strengthen ESG reporting and optimize board structures to maximize the benefits of ESG practices. These insights offer both theoretical and practical guidance for policymakers, investors, and corporate managers seeking to improve sustainability outcomes and financial performance in the Saudi market.

Skaperas, V. (2023). The impact of environmental, social, and governance (ESG) factors on corporate financial performance.

This study investigates the relationship between Environmental, Social, and Governance (ESG) factors and company performance, focusing on the moderating role of board characteristics in EUROSTOXX 600 companies. Using panel data from 429 firms between 2012 and 2022, financial performance was measured via Return on Assets (ROA) and Tobin's q. The results indicate a significant negative relationship between ESG and its individual components (E, S, G) with both performance measures, suggesting potential trade-offs between sustainability efforts and financial outcomes. Regarding board characteristics, gender diversity negatively affects Tobin's q, whereas board independence shows no significant impact. The study recommends that firms carefully balance ESG initiatives with financial objectives and consider the composition of their boards when integrating sustainability strategies. These findings contribute to the literature by highlighting the complex interplay between ESG practices, board governance, and corporate financial performance, offering insights for managers, investors, and policymakers.

5. Methodology

The section is a thorough description of the research methodology used to examine the relationships between the financial performance, board characteristics, and corporate Environmental, Social, and Governance (ESG) performance in European listed firms. This section serves primarily to give a clear and systematic description of the methodological approach employed in this research including the research design, methodology of data collection, selection of sample, measurement of variables and specification of empirical model. According to theoretical viewpoints, the performance of firms, as well as their governance structure and management decisions, have an impact on corporate transparency and the socially responsible practices that are manifested in ESG practices (Friede, Busch & Bassen, 2015).

The independent variable is the performance of the ESG in terms of the composite ESG Score of Refinitiv / LSEG and its three pillar scores (Environmental, Social, and Governance) (Refinitiv / LSEG, 2024). The former analysis examines the hypothesis of whether firm-year variations in financial performance are statistically related to changes in ESG outcomes. Measurement of financial performance is done based on accounting and market indicators. In particular, the accounting measures are Return on assets (ROA) and Net profit margin (NPV) (Fama and French, 1992; Nariswari and Nugraha, 2020), whereas the market-based measures are TQ (Tobin, 1969) and Q (Coluccia et al., 2020). The use of various performance measures gives the chance to perform a profound evaluation and the results of the analysis are not restricted to one issue of firm performance, which adds to the strength of the analysis (Wooldridge, 2010).

The second analysis is that which investigates whether the characteristics of the boards mediate the correlation between financial performance and the ESG results. This moderation is founded on the notion that the board monitoring and advisory capability may be necessary in the effectiveness of financial performance in translating to better ESG practices (Adams and Ferreira, 2009; Coles, Daniel and Naveen, 2008). Board attributes consist of Board Size, Board Independence, and Board Gender Diversity (Terjesen, Sealy and Singh, 2016; Zubeltzu Jaka et al., 2020). Board Size embodies the possible variety of skills and decision-making ability; Board Independence is an ability of non-executive directors to scrutinize managerial activity without any conflict of interest; and Board Gender Diversity is an impact of different views and inclusive decision-making on ESG involvement (Adams and Ferreira, 2009; Safiullah et al., 2022). Bidirectional relationships between financial performance variables and board attributes are also examined to determine the presence of positive or negative relationship between the financial and ESG relationship (Aiken and West, 1991).

In general, the research follows an archival, quantitative research design that involves a longitudinal firm-year panel that consists of STOXX Europe 600 index which spans over 2010 to 2023 (Bifulco et al., 2023). This design would allow examining both temporal and cross-sectional changes in ESG performance, financial performance, governance, (Greene, 2012). The information is received in Refinitiv Eikon/LSEG Workspace, which offers unified data on ESG ratings, financial data, market data, and corporate governance features (Refinitiv / LSEG, 2024). The relationships of interest are estimated with the help of two-way fixed-effects models, which consider the effects of firms and years, and the standard errors are clustered on the firm level in order to overcome the problem of heteroskedasticity and within-firm serial correlation (Wooldridge, 2010). Besides, continuous variables are preprocessed and winsorized to minimize the impact of extreme values and an extensive collection of firm-specific control variables is implemented to eliminate the omitted-variable bias (Kwak and Kim, 2017; Leys et al., 2019).

6. Research Design and Data

The research design is an archival and quantitative research design based upon firm level panel data. The primary goal is to investigate the relationship between ESG performance and financial performance, board features in the long-run (Wooldridge, 2010). The study can utilize both cross-sectional and temporal variations because it captures both by adopting a panel design, which accurately estimates within-firm relationships and allows controlling the unobserved heterogeneity among firms (Greene, 2012).

The empirical setting is the STOXX Europe 600 index which offers a big and diversified sample of publicly listed companies in leading European economies and industries (Bifulco et al., 2023). The 2010-2023 timeframe is the time when ESG reporting grows significantly, regulatory focus on sustainability rises, and corporate governance and financial disclosure practice reforms occur (Friede, Busch and Bassen, 2015; Refinitiv / LSEG, 2024). The panel enables the research to not only measure longitudinal variations in the engagement of ESG and the structures of governance, but also to control the macroeconomic and market-wide shocks with the year-fixed effects (Wooldridge, 2010).

6.1 Population and Sample

The population of the study is presented by the publicly listed companies included in the index of STOXX Europe 600 which represents some of the largest economies across Europe and several industry sectors. The final estimation sample is skewed because of the differences of the availability of ESG scores, financial performance measures, and governance characteristics. The sample size used in the baseline ESG performance analyses consists of about 4,8005,100 firm-year observations of about 435 companies, where the average length of the data is 11 years (Bifulco et al., 2023). The moderation and mediation tests are based on a smaller sub-sample, which is dictated by access to board of directors' characteristics variables (Bermpei et al., 2019; Wang and Hou, 2024). In spite of this imbalanced design, the panel dataset gives sufficient longitudinal substance to permit plausible fixed-effects estimation, and sound inference (Wooldridge, 2010).

6.2. Data Sources

All of the information used is secondary and based on Refinitiv Eikon / LSEG Workspace that contains consistent and harmonized ESG, financial, market, and governance data of STOXX Europe 600 companies (Refinitiv / LSEG, 2024). The ESG data are an aggregate of composite score, and pillar scores on the performance of Environment, Social, Governance scores and are measured on a 0100 scale (Alsayegh et al., 2020). Financial and governance information, such as balance sheet and income statement components, stock market valuations, and board structure are available in the same database within which variables are measured and aligned (Refinitiv / LSEG, 2024).

6.3. Measurement of Variables

The Refinitiv/LSEG composite ESG Score is used to measure ESG Performance, and it is measured in 0-100, with the higher value indicating greater ESG engagement and disclosure (Alsayegh et al., 2020). The composite score is further broken down into Environmental, Social, and Governance pillar scores to give specific information on each of the ESG performance dimensions (Clément et al., 2022).

The three indicators that are used to capture Financial Performance are as follows. ROA (net income/total assets) is one of the measures of the operational efficiency based on accounting (Indrati, 2021). NPM (net income/total revenue) is the profitability expressed in terms of sales (Nariswari and Nugraha, 2020). Q (market value of equity/total assets) is a market-based measure of valuation, which includes rating of future growth and risk by investors (Shaikh, 2022; X. Yu and Xiao, 2022).

Board Characteristics are Board Size (number of directors), Board Independence (percentage of independent non-executive directors), and Board Gender Diversity (percentage of women directors) (Elabib, 2025; Safiullah et al., 2022; Terjesen et al., 2016). These variables are not only direct predictors, but also interaction moderators between them and financial performance indicator (Adams and Ferreira, 2009).

Control Variables: Firm size (log of total assets, lnTA), capital intensity, leverage, cash holdings, growth of revenues, quick ratio, price volatility and CFO margin. These variables consider other explanations and minimize the omitted-variable bias, which helps to have more valuable estimates of the main relationship of interest (Duan et al., 2023; Shin et al., 2022).

6.4. Sample Construction

The first sample will include all companies listed on the index STOXX Europe 600 in the years 2010-2023 (Bifulco et al., 2023). All observations without ESG scores are dropped since the latter is the main outcome variable. The absent figures of financial performance or control variables are also eliminated (Wooldridge, 2010). The analyses of board characteristics are made using subsamples to ensure that all covariates have full data (Bermpei et al., 2019; Wang and Hou, 2024). The last panel is also imbalanced but has enough longitudinal observations to allow the firm-fixed-effects estimation (Wooldridge, 2010).

6.5. Data Screening

Normality in all the continuous variables is tested through skewness, kurtosis and Jarque Bera test (Desgagné and Micheaux, 2018; Bai and Ng, 2005). Winsorization of extreme values of 1 st percentile and 99 th percentile is used to eliminate the impact of the outliers, especially the variables with Net Profit Margin measures (Kwak and Kim, 2017; Leys et al., 2019). Such preprocessing improves the strength of the statistical estimates and prevents the possible bias that could occur due to extreme values (Greene, 2012; Wooldridge, 2010).

6.6. Empirical Model Specification

Model families that were used in the study. Baseline ESG-performance models are the models of estimating the relationship between financial performance and ESG outcomes (Wooldridge, 2010). Moderation models also incorporate interaction between the financial performance and board characteristics in order to determine whether this relationship is bolstered or diluted by board characteristics (Aiken and West, 1991). Each of the models uses two-way fixed effects estimation, firm effects, and year effects, and the standard errors are clustered at the firm level to consider the heteroskedasticity and serial correlation (Wooldridge, 2010; Greene, 2012). Winsorizing continuous variables helps to reduce the sensitivity to outliers (Kwak and Kim, 2017), and variance inflation factors measure the presence of multicollinearity, which is low and justifies the inclusion of all covariates (Wooldridge, 2010).

These methodological decisions enable the sound evaluation of the postulated associations, the consideration of firm and time specific variables, the reduction of the possible bias, and a strict system of empirical testing. The study helps to learn how the financial performance, board factors affect corporate ESG engagement in one of the European settings by incorporating accounting, market, governance, and ESG data into the single framework (Friede, Busch and Bassen, 2015; Refinitiv / LSEG, 2024).

7. Result

This part shows the empirical results of the research, studying the connection between the ESG performance, financial performance and board characteristics. A description of statistics is initially presented to give a summary of the main variables, namely the ESG scores and the elements of their environmental, social and governance, financial performance indicators (ROA, the Tobins Q, Net Profit Margin) and board features. These statistics provide a clue as to how the variables are distributed, variable, and the possible skewness to be used later in the analysis.

After the descriptive analysis, regression equation is undertaken to determine the effect of aggregate ESG performance and its aspects on the financial performance. The moderation tests are used to examine the role of board size and board independence on the relationship between ESG measures and firm performance.

The findings are tabulated in a systematic way and significant, non-significant effects are identified and a clear explanation of coefficients, t-statistics, p-values, and interaction or indirect effects is given. Based on this section, one can get a thorough insight into how the ESG performance has been shown to affect firm outcomes.

Table 1. Descriptive statistics – estimation sample for ESG–performance and board characteristics models

| Variables | Mean | Median | SD | Min | Max | p25 | p75 | Skewness | Kurtosis |
|------------------------|--------|--------|--------|---------|--------|--------|--------|----------|----------|
| ESG Score | 65.761 | 68.735 | 16.748 | 12.05 | 92.36 | 55.7 | 78.45 | -0.788 | 3.224 |
| Environmental Score | 64.397 | 68.78 | 22.389 | 0.76 | 97.12 | 50.85 | 81.86 | -0.766 | 2.928 |
| Social Score | 69.711 | 74.51 | 19.771 | 10.77 | 96.83 | 57.67 | 85.17 | -0.988 | 3.444 |
| Governance Score | 60.789 | 63.945 | 20.727 | 10.26 | 94.92 | 46.13 | 77.22 | -0.502 | 2.43 |
| ROA | 0.068 | 0.056 | 0.075 | -0.149 | 0.417 | 0.029 | 0.095 | 1.36 | 7.971 |
| Tobin's Q | 1.698 | 1.179 | 1.585 | 0.042 | 9.378 | 0.811 | 1.95 | 2.616 | 10.811 |
| Net Profit Margin | 9.762 | 7.49 | 16.602 | -62.060 | 193.08 | 3.49 | 13.56 | 4.061 | 44.536 |
| Size (lnTA) | 16.032 | 15.976 | 1.459 | 11.681 | 20.19 | 15.063 | 17.074 | 0.066 | 2.772 |
| Capital Intensity | 0.257 | 0.209 | 0.203 | 0 | 0.96 | 0.097 | 0.373 | 1.063 | 3.772 |
| Leverage | 0.57 | 0.581 | 0.172 | 0.096 | 0.99 | 0.46 | 0.694 | -0.261 | 2.85 |
| Cash Holdings | 0.122 | 0.097 | 0.101 | 0.001 | 0.639 | 0.055 | 0.155 | 2.086 | 9.175 |
| Revenue Growth | 7.226 | 5.425 | 18.838 | -48.820 | 116.6 | -0.790 | 13.06 | 1.955 | 13.463 |
| Board Size | 11.055 | 11 | 3.699 | 2 | 26 | 8 | 13 | 0.772 | 3.414 |
| Board Independence | 61.396 | 61.54 | 23.332 | 0 | 100 | 47.37 | 77.78 | -0.408 | 2.921 |
| Board Gender Diversity | 29.368 | 30 | 13.265 | 0 | 75 | 20 | 38.46 | -0.235 | 2.769 |

| | | | | | | | | | |
|------------------|--------|--------|-------|--------|-------|------|-------|-------|--------|
| Quick Ratio | 1.052 | 0.9 | 0.691 | 0.22 | 5.02 | 0.67 | 1.19 | 2.954 | 14.717 |
| Price Volatility | 22.856 | 21.875 | 6.405 | 11.35 | 44.07 | 18.3 | 26.59 | 0.632 | 3.149 |
| CFO Margin | 0.1 | 0.089 | 0.066 | -0.074 | 0.386 | 0.06 | 0.126 | 1.272 | 6.505 |

Table 1 shows the descriptive statistics of the estimation sample used to analyze the ESG performance, financial indicators and board characteristics. The average ESG Score of the sample is 65.76, with social dimension ranking the highest in terms of average (69.71) and the lowest governance (60.79), indicating that the company probably performs better in its social activities than its governance practices. There is significant dispersion in financial performance: ROA stands on average at 6.8, with a large standard deviation of -14.9 -41.7 and a large portion of firms with extreme high market valuation as indicated by a significant skewness (2.616) and kurtosis (10.811) in the Tobin indicator. Board characteristics suggest that the board size is average with about 11 members, the level of independence is about 61, and there is a moderate level of gender diversity with nearly 29 members of the board and a huge number of independent directors. The firm size (lnTA), leverage, capital intensity, cash holdings, growth in revenue, quick ratio, price volatility, and CFO margin are examples of control variables that are highly dispersed indicating that operational and financial characteristics of firms vary. In general, these statistics give the basis of the distribution, variability, and possible skewness of the key variables to be utilized in the further regression and moderation, analysis.

Table 2: Regression Analysis of ESG Dimensions on Financial Performance

| Dependent Variable | Financial Measure | Coefficient | t-stat | p-value | Within R ² | Obs. |
|--------------------------|-------------------|---------------|--------------|--------------|-----------------------|-------|
| Overall ESG | ROA | -1.467 | -0.43 | 0.669 | 0.435 | 4,802 |
| | Tobin's Q | 0.197 | 0.69 | 0.489 | 0.446 | 5,106 |
| | Net Profit Margin | -0.011 | -1.10 | 0.271 | 0.447 | 5,105 |
| Environmental (E) | ROA | -8.945 | -2.11 | 0.036 | 0.242 | 4,802 |
| | Tobin's Q | 0.540 | 1.29 | 0.198 | 0.246 | 5,106 |
| | Net Profit Margin | -0.021 | -1.54 | 0.124 | 0.247 | 5,105 |
| Social (S) | ROA | 3.209 | 0.66 | 0.510 | 0.362 | 4,802 |
| | Tobin's Q | 0.547 | 1.35 | 0.178 | 0.378 | 5,106 |
| | Net Profit Margin | -0.004 | -0.25 | 0.805 | 0.377 | 5,105 |
| Governance (G) | ROA | 2.317 | 0.44 | 0.659 | 0.215 | 4,802 |
| | Tobin's Q | -0.509 | -1.33 | 0.186 | 0.214 | 5,106 |
| | Net Profit Margin | -0.001 | -0.05 | 0.956 | 0.213 | 5,105 |

The table 2 shows how overall ESG and its aspects, including Environmental (E), Social (S), and Governance (G) have an influence on three parameters of financial performance, such as ROA, the Q of Tobin, and the Net Profit Margin. In general ESG, the coefficients are -1.467 (ROA), 0.197 (Tobin Q) and -0.011 (Net Profit Margin) with p-values of 0.669, 0.489 and 0.271 respectively, which does not have a statistically significant impact on any of the financial performance indicators. On Environmental score, its ROA coefficient is -8.945 and t-statistic = -2.11 and p-value = 0.036 which is statistically significant at the 5 percent level indicating that as the environmental performance increases, accounting profitability decreases. Environmental, however, has coefficients of 0.540 of the Q, (p = 0.198) of Tobin and coefficients of 0.021 of Net Profit Margin (p = 0.124) which are not significant. The Social score has positive coefficients to ROA (3.209) and Tobin's Q (0.547), but negative coefficient to Net Profit Margin (-0.004) with high p-values (0.510, 0.178, 0.805), and so the correlation is not significant. Likewise, the Governance score coefficient is 2.317 (ROA), -0.509 (Tobin Q), and -0.001 (Net Profit Margin) with p-values of 0.659, 0.186 and 0.956 respectively and is not significant. Altogether, the Environmental dimension, only, has a statistically significant negative impact on ROA, whereas the overall ESG, Social, and Governance dimensions have insignificant impacts on all financial performance indicators.

Table 3: Moderating Effect of Board Characteristics on the Relationship between ESG and Financial Performance

| Moderator | Financial Performance Measure | Interaction Term | Coefficient | t-stat | p-value | Within R ² | Obs. |
|--------------------|-------------------------------|--------------------------------|--------------|-------------|--------------|-----------------------|-------|
| Board Size | ROA | ROA × Board Size | 1.529 | 2.38 | 0.018 | 0.436 | 4,796 |
| | Tobin's Q | Tobin's Q × Board Size | 0.078 | 1.18 | 0.237 | 0.436 | 4,796 |
| | Net Profit Margin | NPM × Board Size | 0.001 | 0.40 | 0.687 | 0.435 | 4,796 |
| Board Independence | ROA | ROA × Board Independence | -0.0298 | -0.22 | 0.826 | 0.444 | 4,796 |
| | Tobin's Q | Tobin's Q × Board Independence | 0.0047 | 0.58 | 0.563 | 0.444 | 4,796 |
| | Net Profit Margin | NPM × Board Independence | -0.0002 | -0.36 | 0.716 | 0.444 | 4,796 |

The table 3 analyzes the impact of the board size and the board independence on the relationship between the measures of the ESG and financial performance measures (ROA, Tobin Q, Net Profit Margin). In the case of Board Size, the interaction coefficient (ROA × Board Size) has a t-statistic of 2.38, a p-value of 0.018, which is statistically significant and at the 5% level, there is a positive moderation effect. This indicates that increasing the size of boards enhances the positive influence of ROA on the performance of firms. But terms of interaction with Q (0.078, $p = 0.237$) and Net Profit Margin (0.001, $p = 0.687$) of Tobin are not significant, and hence, the board size does not significantly moderate these relations.

In the case of Board Independence, all the terms of interaction are not significant: ROA × Board Independence = -0.0298 ($p = 0.826$), Tobin's Q × Board Independence = 0.0047 ($p = 0.563$), and Net Profit Margin × Board Independence = -0.0002 ($p = 0.716$). The results mentioned above suggest that the proportion of independent directors in the board does not substantially moderate the association between ESG performance and any financial performance measure.

To conclude, the moderation effect of board size on ROA is significant, whereas board independence does not have a significant moderating effect on any of the financial performance measures.

8. Discussion and Conclusion

The results of this article offer subtle empirical data on directional relationship between financial performance and ESG performance among European listed companies, although it brings out the conditioning factor of corporate governance mechanisms. The analysis provides unobserved firm heterogeneity and time effects by a two-way fixed-effects panel regression that captures the estimates of the relationships between independent and dependent variables as variations within a firm over time and is not cross-sectional structural differences. This rigor of methodology boosts the validity of the conclusions made on the effectiveness of the independent, moderating and mediating variables.

In regard to the direct correlation between financial performance and ESG performance (H1), the findings reveal that the overall ESG performance does not have statistically significant effect on the accounting based (ROA, Net Profit Margin) and market based (Tobin's Q) financial performance. This indicates that the level of ESG engagement in the STOXX Europe 600 setting lacks a systematic conversion to financial returns in the short-term. This kind of evidence is congruent with the observation of Skaperas (2023), who reports by example of mixed and even negative ESG-financial performance links among European companies. It also echoes the meta-analytic review carried out by Friede et al. (2015) that highlights the fact that ESG-financial nexus is a context-specific phenomenon that is frequently determined by regulatory maturity, industry specifics, and measurement tools.

When ESG is however disaggregated to the pillars of Environmental, Social and Governance, however, a differentiated pattern can be observed. Environmental dimension has a statistically significant negative correlation with ROA. The finding confirms the short-term trade-off theory that accounted in the sense that environmental investments, including emission reduction technologies, compliance upgrades, and sustainability restructuring, would introduce short-term costs that would lead to a decline in accounting profitability. This finding aligns with the thesis put forward by Chen et al. (2023) who believe that environmental initiatives can lead to the initial reduction in profitability and eventually become strategic

and reputational in the long term. In the Resource-Based View, such investments are strategic resource investments, whose financial serves are more probable to be realized over a long period than in the accounting terms of the time.

Speaking of the moderating hypotheses (H2a -H2c), the empirical data indicate that the board size contributes to the relationship between the ROA and ESG performance to a significant degree. This implies that the bigger the board of a firm, the more the likelihood of the firm to translate financial profitability into increased ESG engagement. Bigger boards can be more diverse in their skills, representation of stakeholders, and strategic argument and thus enhance the distribution of discretionary financial resources to sustainability programs. The result coincides with those of Rossi et al. (2021) and Chouaibi et al. (2021), who demonstrate that the efficiency of CSR–performance relationships can be conditioned by the nature of boards. The meta-analytic results of Endrikat et al. (2021) also provide its support due to the positive correlations between the board structural attributes and CSR engagement.

On the contrary, in board independence, a statistically significant moderating effect is not observed. This implies that formal independence is not necessarily enough to increase sustainability-oriented strategic decisions. Independent directors can enhance monitoring, yet, lacking particular ESG skills or alignment, independence does not always equal active investment in sustainability. This result coincides, in part, with Sharawi (2024), who states that the effectiveness of board characteristics also depend on the contextual and institutional conditions as opposed to the structural attributes.

These results combine Agency Theory, the Stakeholder Theory, and the Resource-Based View in theory. Financial performance is the ability to make the investments in sustainability but the structures of governance show whether or how those funds can be committed. ESG intervention, then, does not simply seem as a product of financial accessible nature but rather as a product of board-level strategic orientation. The data indicates that the quality of governance (primarily, the board size as the measure of strategic diversity) is more decisive than financial ratios by itself in transforming profitability into sustainability results.

In conclusion, the financial-ESG relationship in the European listed companies is multifaceted, contingent, and dimension based. Profitability is not necessarily optimizing the overall ESG performance, environmental activities can require short-run accounting trade-offs and governance structures, in particular the size of a board, has a great influence on how financial resources are converted into sustainability engagement. These findings are valuable to the literature because they can be used to understand the directionality of the relationship between financial and ESG performance in a longitudinal European panel framework and to show that governance structures play the important role of influencing the efficacy of sustainability strategies.

9. Recommendations

Due to the empirical results and theoretical implications of this research, a number of suggestions can be offered to the corporate leaders, policymakers, and future researchers:

1. Incorporate ESG in the long-term strategic planning instead of the short-term financial analysis.

Given that environmental investments could decrease the short-term profitability, the companies need to use long-term performance lenses to assess sustainability activities.

2. Maximize boards to promote strategic ESG participation.

The bigger boards seem to enhance translation of profitability to ESG performance. Companies must make sure that there is proper diversity in the knowledge of expertise, sustainability, and representation of stakeholders in boards.

3. Move beyond formal independence in board structure.

Since board independence does not substantially mediate the financials linkage, active engagement, sustainability competence, and strategic alignment should be a key consideration of firms, not structural independence.

4. Implement divergent ESG practices.

Since environmental, social, and governance pillars have heterogeneous impacts, companies are to design ESG strategies based on the features of their sectors, the level of regulatory pressure, and financial capabilities.

5. Promote incentives of long-term sustainability.

Regulatory systems ought to appreciate that environmental investments might cause short-term financial burdens and thus offer incentives to that end that will tie long-term sustainability in a stable financial condition.

6. Future studies must be done in relation to dynamic and sector effects.

Future research can look into industry heterogeneity, ESG investment lagged effects or cross-country institutional variations in Europe.

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