Journal of Environmental Management 354 (2024) 120390

Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman

Research article

The effect of ESG and CSR attitude on financial performance in Europe: A quantitative re-examination

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A B S T R A C T

Focusing on the European context, this paper re-examines the relationship between the ESG and financial performance and whether CSR attitude moderates this relationship. A panel data set with all the listed companies in STOXX Europe 600, covering the period 2012–2022 was built, with company data being sourced from the Refinitiv Eikon platform for a total of 6600 firm-year observations. Six measures of financial performance and three regression frameworks were considered for analysis. Overall, inconsistent patterns of effect are identified across ESG predictors and financial performance measures. The presence of a CSR committee was found to negatively moderate the effect of ESG score on ROA only, whereas an external auditor to the CSR report to negatively moderate it with share price. Future research should consider replicating the proposed re-examination framework in other data settings and legislative and accounting contexts to strengthen the current evidence base and therefore deepen our understanding of the mechanisms underlying the investigated relationships.

1. Introduction

Corporate Social Responsibility (CSR) and sustainability have profoundly transformed the realms of finance and accounting, guiding the pursuit of sustainable finance objectives championed by both institutional investors and individuals seeking to invest in companies demonstrating robust environmental, social, and governance (ESG) performance. In the present landscape, the prominence of ESG performance has heightened to address the increasing demands from several stakeholders, including shareholders, customers, regulators, employees, suppliers and many more, for companies to exhibit greater responsibility toward the environment and society (Arif et al., 2021; Camilleri, 2015). As a result, managers are increasingly placing emphasis on ESG indicators to communicate their commitment to sustainability goals, engaging in ESG-related activities to enhance their reputation and serve their self-interest Broadstock et al. (2019) (see Table 5).

Evidence on the relevance of ESG scores in predicting financial performance has rapidly accumulated over the last decade, with recent studies investigating the moderating role that a company's attitude toward CSR can have on this relationship (Bifulco et al., 2023; Bruno et al., 2023). These studies, however, have presented conflicting and often inconclusive findings. Among other factors potently explaining such inconsistency, the legislative and regulatory context in which this association is studied is likely to influence both the magnitude and direction of respective effect estimates considerably. Building on previous research studies focusing on Europe, a quantitative re-examination of the effect that ESG score has on financial performance is conducted. To this end, robust heterogeneity analyses are performed considering both total ESG score and its of each three pillars, as well as six indicators of financial performance. The test the effect of choice of model selection, data were fitted using three regression frameworks with the respective models being compared. The moderating role of CSR attitude, including the presence of a CSR committee as well as stakeholder engagement, the presence of an external auditor to the CSR report and CSR strategy, is also investigated. To conduct this investigation, a panel dataset covering all the 600 companies that are listed in the STOXX 600 index Europe from 2012 to 2021 was built. Company data were sourced from the Refinitiv platform.

Overall, findings from this study indicate that ESG score are positively associated with financial performance in Europe, though with marked variation across ESG scores. This study also sheds light on the effect that choice of regression framework can have on the estimated effects and presented a novel approach to account for industry-specific effects by conducting multi-level analyses. Attitude towards CSR does not appear to play a vital role in moderating the studied association, except for presence of a CSR committee and whether a company's CSR report is subjected to external auditing both of which negatively affect it.

The subsequent sections of the paper are organized as follows: a review of relevant literature and hypotheses development, followed by a presentation of the empirical strategy adopted including analytical methods and data. The following section presents the analytical results and the last concludes with a discussion of the study findings and some final remarks.

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https://doi.org/10.1016/j.jenvman.2024.120390
Received 2 January 2024; Received in revised form 1 February 2024; Accepted 10 February 2024

2. Literature review and hypothesis development

Several theories have been developed which can be applied to explain the relationship between ESG and financial performance, including stakeholder theory (Donaldson and Preston, 1995), institutional theory (Pinheiro et al., 2023), signalling theory (van Zijl et al., 2017) and many more. This study was framed around the value-relance and neo-institutional theories which are briefly presented in the paragraphs below.

2.1. Value-relevance theory

The theory of value relevance focuses on the utility of accounting information as perceived by equity investors. Barth et al. (2001) define it as research that explores "the connection between accounting figures and the market values". One aspect of this research focuses on examining whether ESG scores contribute to improved financial performance. The link between ESG and financial performance is grounded in the notion that companies disclosing more information about ESG-related issues, and consequently allocating more resources to CSR activities, are likely to adopt sustainable business practices. This, in turn, could lead to corporate enhancements, competitive advantages, and an enhanced corporate reputation (Branco and Rodrigues, 2006; Bui et al., 2020). An inquiry therefore revolves around whether higher ESG ratings are indicative of superior financial performance. The assumption is that companies actively involved in addressing ESG issues, as gauged by ESG scores, are likely to attain enhanced financial performance. This also aligns with Freeman's stakeholder theory, positing that companies bear responsibility toward all stakeholders (Clarkson, 1995). Dissatisfaction within any of these stakeholder groups, according to this theory, has the potential to adversely impact financial performance (Barman, 2018).

2.2. Neo-institutional theory

Neo-institutional theory asserts that changes occurring within an institution follow a structured or systematic pattern (Scott, 2001), leading organizations to exhibit similar or reflective behaviours. DiMaggio and Powell (1991) termed this uniform behaviour among organizations as institutional isomorphism, categorizing it into mimetic, coercive, and normative isomorphism (Scott, 2001).

In accordance with neo-institutional theory, various environmental forces impact organizations' decisions to disclose their CSR activities (Chan and Ananthram, 2020). Organizations respond to both internal and external pressures, engaging in mimetic isomorphism (imitating the behaviour of other organizations), coercive isomorphism (adapting behaviour due to external pressures), or normative isomorphism (adopting specific systems or standards to gain recognition). Given this theoretical framework, variations in organizational behaviour based on regulations, geographic region, industry, economic conditions, and other factors systematically influencing the relationship between ESG and financial performance need to be placed at the centre of empirical investigations.

2.3. Hypothesis development

Extensive research has been conducted on the association between ESG and financial performance. However, the current evidence base is not conclusive as to whether CSR-related activities and therefore ESG score pay off to organizations by superior financial performance, with studies presenting conflicting results. For the European context, recently published studies have quantitatively examined this relationship. Agoraki et al. (2023) analysed the association between firm's ESG reputational risk and financial performance measured as ROA, ROE and Tobin's Q in European listed companies over the 2007–2021 period. They documented evidence that firms with lower reputational risk perform better than their counterpart. Hamdi et al., 2022 analysed a sample of 813 European firms over the 2008–2017 period focusing on ROA and Tobin's Q ratio. The authors found that the impact of CSR on financial performance is positive and significant only if the environment, social and governance score surpasses the threshold of 56.78%.

Koundouri et al. (2022) examined empirically whether a relationship between good ESG performance and good financial condition of companies could be documented, by considering a sample of the top 50 European companies listed in the STOXX Europe ESG Leaders 50 Index and found conflicting results between the different financial indicators including ROA, ROE and profit margin. A dataset of 4800 company-year observations from the 2014–2020 period from the European STOXX 600 index was analysed by Bifulco et al. (2023) and found a negative association between ESG score and market share price. Focusing on the food industry, Sandberg et al. (2022) investigated how ESG ratings impact financial performance using an ordinary least squares regression approach. The regression models were run on data from 83 companies followed for a 4-year time period (2017–2020) and results indicated a modest positive association between ESG score and ROA or ROE.

As highlighted by a meta-analytic (Gupta and Das, 2022) and a review of measurement approaches (Galant and Cadez, 2017) such inconsistencies between study findings may originate from the different choices analysts made in terms data setting, choice of regression framework and financial performance indicators considered. Therefore, aiming to shed light on these sources of uncertainty, the present study re-examined the above association for the European context by addressing the following research question.

H1. How does ESG performance relate to financial performance?

In recent years, the role of a company's attitude towards CSR activities has gained increased traction among scholars. The extent of CSR disclosure is affected by the prevailing rules and regulations in the country and industry. Organizations can implement and communicate their CSR strategy either proactively or reactively (Chang, 2015), based on the idea that companies can be at different stages in terms of their attitude toward meeting CSR objectives and institutional posture (Rim and Ferguson, 2020). In this respect, the presence of a CSR committee or team can potentially play a significant role in signalling this attitude to capital markets ((Baraibar-Diez and Odriozola, 2019)). The CSR committee is a governance body generally composed by three or more directors, with at least one independent member, which assists and manages the formulation of a CSR strategy (Shaukat et al., 2016). Previous studies have showed that the presence of a CSR committee can positively affect CSR disclosure (Liao et al., 2015) overall ESG performance (Burke et al., 2019). However, no evidence has been found for this or the presence of an external auditor to the CSR report to affect financial performance (Panwar et al., 2023) or moderate the relationship between ESG and financial performance (Bifulco et al., 2023). Along the same lines, evidence for whether stakeholder engagement activities carried out by the company seems not to be conclusive, with studies finding positive effects (Gupta et al., 2020) and neutral or negative effects (Ghassim and Bogers, 2019).

Therefore, based on the present literature review, it is possible to come to the conclusion that no reliable evidence currently exists on whether a company's CSR attitude defined in terms of the presence of a CSR committee, stakeholder engagement, external auditing of and CSR strategy. This study therefore posits the following research question.

H2. Does CSR attitude moderate the association between ESG and financial performance?

3. Materials and methods

3.1. Data setting

Following the European Union directive 2014/95/EU in 2014, large companies (those with more than 500 employees) are mandated to disclose non-financial information about their ESG activities and

impacts alongside their financial reporting obligations. Consequently, the sample of companies used in this study is not influenced by sample selection bias, a common issue in studies relying on data provided voluntarily by firms. In addition, focusing on a single, yet complex geographical area helps mitigate the risk of omitted-variable problem, which is often a much greater concern for studies covering multiple heterogeneous areas with different financial accounting regulations, jurisdiction and practices, making it easier to control for all fixed characteristics simultaneously affecting the dependent and independent variables (De Jong et al., 2008). Company data on the top 600 companies listed in the STOXX 600 index for the last decade (2012–2022) were sourced from Refinitiv platform (Eikon, 2022), which has been widely used in previous relevant studies. The data were extracted on spreadsheets and subsequently imported into STATA 16 software (StataCorp, 2019) for subsequent analysis.

3.2. Variables

The dependent variable was financial performance which was measured both in terms of accounting-based and combine capital market-accounting metrics (all continuous variables), namely: ROA, ROE, earnings before interest and tax margin (EBITM), earning per share (EPS), price earnings ratio (PER) and share price (PRICE). ROA was measured as the current year's net income divided by average between previous and current year's total assets; ROE as the current year's net income divided by average between previous and current year's equity; EBITM calculated by taking the pre-tax income and adding back interest expense on debt and subtracting interest capitalized, all divided by net sales, that is gross sales and other operating revenue less discounts, returns and allowance; EPS as the company's net profit divided by the number of common outstanding shares; PER calculated as the (average) share price divided by the earnings rate per share; PRICE as the market price of the share at the relevant month end.

The main explanatory variable was ESG performance, which was proxied by the ESG score provided within the Refinitiv platform (continuous measure). The ESG score is derived as a weighted average of three index constituents or pillars: environmental, social, and governance. This score is based on ten subcategories designed to reflect a company's ESG performance, commitment, and effectiveness, utilizing publicly reported information. Within Refinitiv Eikon, the three pillars receive scores ranging from 0 (worst) to 100 (best), and these scores are weighted as follows: environmental (0.44), social (0.31), and governance (0.25, Eikon, 2022). CSR attitude was the moderating variable considered for addressing hypothesis 2. This dimension was defined using four declinations: CSR strategy, which reflects a company's practices to communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes (csrstrat, continuous variable, from 0 to 100); stakeholder engagement, which is measured as the company's ability to explain how it engages with and involving its stakeholders in its decision-making process (csrse, binary variable, yes = 1, no = 0); whether company has an external auditor of its CSR or sustainability report (csrsea, binary variable, yes = 1, no = 0); and whether it has a CSR committee or team, that is board level or senior management committee responsible for decision making on its CSR strategy (csrsc, binary variable, yes = 1, no = 0).

Based on the extant literature on the determinants of financial performance (Lee and Suh, 2022), a set of financial controls were identified, namely: size, measured by the firm's market value of equity (lnmv), total assets (lnta), total revenues (lnrev) and market capitalisation (lnmc) at the end of the financial year (all as natural logarithms, ratio scale variable); leverage, calculated as the ratio between total debt and total assets at the end of the financial year (ratio scale variable); beta, which is a measure of volatility that indicates the degree to which the company share is more (>1.0) or less volatile (<1.0) than the broader market (ratio scale variable); book value per share (bvps), which is the ratio of equity available to common shareholders against the number of shares outstanding (ratio scale variable); market to book value (mtbv), which seeks to evaluate whether a company's share is over or undervalued by comparing the market price of all outstanding shares with the net assets of the company.

3.3. Empirical strategy

Two sets of regression models were estimated in accordance with the respective hypotheses. To address hypothesis 1, the relationship between financial performance (FP) and ESG score was evaluated, after controlling for the effect of relevant financial factors (financial controls) and company's fixed effects (ς). Given the expected heterogeneous effects indu

ced by industry, company (i) effects were clustered within industry (j), where β1 is the regression coefficient of interest, as follows:

$$FP_{ijt} = \beta_0 + \beta_1\, ESG_{ijt} + B_2\, financial\ controls_{ijt} + \varsigma_{ij} + \varepsilon_{ijt} \quad (1)$$

In the second set of models, the moderating role of CSR attitude (CSRatt) – measured as was tested on the association between the financial performance and ESG score, using the following equation, where β3 is the regression parameter of interest:

$$FP_{ijt} = \beta_0 + \beta_1\, ESG_{ijt} + \beta_2\, CSRatt_{ijt} + \beta_3\, CSRatt_{ijt} * ESG_{ijt} + B_4\, financial\ controls_{ijt} + \varsigma_{ij} + \varepsilon_{ijt}$$

3.4. Statistical analysis

Summary statistics were used to describe the sample of companies and their characteristics. Pearson's pairwise correlations were computed between the identified variables to explore sign and magnitude of univariate linear associations. A forward stepwise approach for model specification was employed, with regression models being built progressively.

Capitalising on the panel structure of the data and given an expected industry-level heterogenous treatment effects, a multi-level, mixed-effect generalised linear model approach with Gaussian specification was employed, robust standard errors to address the issue of heteroskedasticity (White, 1980). To test for the effect of choice of regression framework, the specified models were adopted also using an ordinary least square and a linear panel regression approach. A Hausman test was used to select the best model, that is, either the fixed effect or the random effect selection to analyse the data (Blackburne III and Frank, 2007).

Specification 1 included only the key explanatory variables of interest, that is ESG scores and CSR attitude variables, as appropriate. The subsequent specification considered a set of financial controls. Given the primary purpose of comparing the effect of predictors across multiple regression framework, all the identified variables were kept in the final model specifications. Interaction terms were used to evaluate the presence of effect modification. Wald tests were used to assess between-category differences. Statistical significance was set at a $p < 0.05$ level. All analyses were performed using STATA 16 software (StataCorp, 2019).

4. Results

From a univariate perspective, ESG scores are consistently associated with lower financial performance as measured by ROA, ROE and EBIT margin, whereas no significant association is found with EPS, price/earnings ratio and share price. The only exception to this pattern is represented by the governance pillar score for which a non-significant association emerges with EBIT margin, whereas is negatively associated with company's share price (see Table 1).

Addressing hypothesis 1 and moving from univariate linear

correlation to regression analysis, Table 2 and Table 3 show the effect that total ESG score (Model 1) and its three pillars have on financial indicators before (Model 2) and after adjustment for financial controls (Model 3), considering industry-level effects (n = 11 industries). Overall, total ESG score does not show to be significantly associated with any financial indicator, except for ROA where a highly significant negative effect is estimated (mean −0.0793, SE 0.0169).

Breaking down the total ESG score into its pillars, significant effects are estimated, the majority of which with a positive sign and heterogeneous patterns. The environmental score is negatively associated with ROA (mean −0.0327, SE 0.0138), price earnings ratio (mean −0.6172, SE 0.3045), but positively associated with share price (0.5804, SE 0.2052), suggesting that a higher score would be associated with worse profitability on the books, but higher present value of a company's future profits from the market. When further adjustments are included, the above associations with share price (0.4095, SE 0.2212) and price per earing ration (−0.5548, SE 0.2730) remain significant with comparable magnitude and consistent direction, whereas positive effect are uncovered with ROA (0.0394, SE 0.0135), particularly with return on assets (0.1198, SE 0.0502). In the fully adjusted models, the social pillar score is found to be strongly and positively associated with price earnings ratio (0.8067, SE 0.4164) but negatively with EPS (−0.5803, SE 0.3358). The latter financial indicator is the only one that appears to be significantly influenced by how the company is governed (0.3941, SE 0.1736).

Appendix I includes the results obtained by estimating the above effects using an ordinary least square and a panel regression approach. Overall, relatively limited consistency is identified with the effect estimates presented above, where effect direction is maintained but both statistical significance and magnitude are affected. This shows how choice of regression model and model specification can impact effect estimation and could help explain, at least to some degree, the inconsistent and often conflicting results in the current evidence base regarding the influence that ESG scores have on financial performance.

Building on Table 2and Table 3 , Table 4 and Table 5 report the moderating effects estimated for CSR attitude as measured by: a company's practices to communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes (CSRSTRAT); whether it engages with its stakeholders and involving them into its decision-making processes (CSRSE); whether the company's CSR report is subjected to external auditing (CSRSEA); and whether there is a board-level or senior management team or committee responsible for decision making on the company's CSR strategy (CSRSC). Overall, CSR attitude is shown to have a non-significant moderating effect on the association between ESG score and financial performance in most instances. However, a moderate negative effect is found between ROA and whether the company has a CSR committee and it engages with its stakeholders (mean 0.0637, SE 0.0251). In addition, a significant effect is estimated for the presence of an external auditor on share price, where this aspect of CSR attitude appears to negatively moderate the effect of ESG score (mean −2.7967, SE 0.5868).

5. Discussion

The paper is concerned with re-examining the association between ESG and financial performance for the European context. To this end, a panel dataset of the top 600 companies listed in the STOXX 600 index over the last decade was analysed, considering six measures of financial performance and both total and pillar-level ESG scores to account for the related sources of heterogeneity. This study found marked heterogeneity of effects across the different scores, with the environmental dimension being more often associated with financial performance than the other two pillars, though inconsistently across accounting-based and market or combined measures. This could indicate that in fact ESG performance does not reliably predict financial performance, at least in this group of companies which are more likely than the rest of the existing companies in the respective markets to operate in similar fashion and posture on the sustainability front. However, given the task at hand, it is also likely that other factors not captured in the model specified could explain the mechanisms underlying the investigated associations. Nonetheless, robustness checks were conducted to mitigate this risk, with three different regression frameworks being tested and compared.

As for the moderating role of CSR attitude, relatively limited evidence was found indicating a significant effect except for the presence of a CSR committee and of an external auditor to the CSR/sustainability report which seem to negatively affect ROA and market price, respectively. As for the former, these results build on previous research by Bifulco et al. (2023) who though found no evidence for this moderating role for share price. However, while analysing essentially the same group of companies, the present study considered a longer time period and implemented an empirical strategy based on a multi-level regression approach which enabled the estimation of industry-specific clustering of the effects, in line with the neo-institutional theory. Such discrepancies in results highlight the importance of re-examination and replication research, like the present study, to unravel the effects that

Table 1
Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) roa	1.000									
(2) roa	1.000*	1.000								
	(0.000)									
(3) ebitm	0.231*	0.231*	1.000							
	(0.000)	(0.000)								
(4) eps	0.079*	0.079*	0.008	1.000						
	(0.000)	(0.000)	(0.567)							
(5) per	−0.021	−0.021	−0.017	−0.016	1.000					
	(0.131)	(0.131)	(0.224)	(0.221)						
(6) price	0.032	0.032	0.000	0.194*	−0.002	1.000				
	(0.016)	(0.016)	(0.990)	(0.000)	(0.904)					
(7) esgscore	−0.115*	−0.115*	−0.070*	−0.002	0.013	−0.011	1.000			
	(0.000)	(0.000)	(0.000)	(0.879)	(0.363)	(0.439)				
(8) envscore	−0.132*	−0.132*	−0.048*	0.003	−0.019	0.019	0.809*	1.000		
	(0.000)	(0.000)	(0.001)	(0.808)	(0.200)	(0.177)	(0.000)			
(9) socscore	−0.121*	−0.121*	−0.068*	−0.021	0.026	0.006	0.888*	0.677*	1.000	
	(0.000)	(0.000)	(0.000)	(0.129)	(0.075)	(0.644)	(0.000)	(0.000)		
(10) govscore	−0.059*	−0.059*	−0.038	0.015	0.012	−0.063*	0.701*	0.341*	0.420*	1.000
	(0.000)	(0.000)	(0.006)	(0.269)	(0.400)	(0.000)	(0.000)	(0.000)	(0.000)	

*$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 2
Effect of ESG scores on financial performance indicators - accounting-based metrics

	ROA			ROE			EBITM		
Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
ESG score	−0.0793***	–	–	−0.1591	–	–	−0.0020	–	–
	(0.0169)	–	–	(0.1064)	–	–	(0.0014)	–	–
Environmental	–	−0.0327**	0.0394***	–	−0.0630	0.1198**	–	−0.0017	−0.0007
	–	(0.0138)	(0.0135)	–	(0.0768)	(0.0502)	–	(0.0027)	(0.0020)
Social	–	−0.0563	−0.0507	–	−0.1790	−0.2010	–	0.0005	0.0007
	–	(0.0438)	(0.0350)	–	(0.1827)	(0.1754)	–	(0.0019)	(0.0022)
Governance	–	0.0089	0.0224	–	0.0676	0.0884	–	−0.0005**	0.0001
	–	(0.0349)	(0.0271)	–	(0.1404)	(0.1299)	–	(0.0003)	(0.0004)
Lnrev	–	–	2.6661	–	–	16.0170	–	–	−0.2139*
	–	–	(2.6706)	–	–	(13.5019)	–	–	(0.1117)
Lnta	–	–	−8.2165**	–	–	−30.2368	–	–	0.0587
	–	–	(4.1092)	–	–	(20.6390)	–	–	(0.0444)
Lnmc	–	–	5.4906***	–	–	12.9145	–	–	0.3473
	–	–	(1.7302)	–	–	(8.9405)	–	–	(0.2508)
Lnmv	–	–	0.5224	–	–	5.3695**	–	–	−0.1959
	–	–	(0.3471)	–	–	(2.2983)	–	–	(0.1894)
Leverage	–	–	−0.0378	–	–	0.1121	–	–	0.0007
	–	–	(0.0250)	–	–	(0.1561)	–	–	(0.0016)
beta	–	–	0.5805	–	–	−1.8382	–	–	0.0293
	–	–	(0.6354)	–	–	(2.6801)	–	–	(0.0271)
bvps	–	–	−0.0001*	–	–	−0.0004	–	–	−0.0000
	–	–	(0.0001)	–	–	(0.0003)	–	–	(0.0000)
mtbv	–	–	0.0265	–	–	0.1445	–	–	−0.0001
	–	–	(0.0333)	–	–	(0.2307)	–	–	(0.0001)
var(id[icbic])	0.0001	0.0001	0.0001	0.0010	0.0010	0.0018	0.0001	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0010)	(0.0009)	(0.0012)	(0.0001)	(0.0001)	(0.0001)
var(_cons[icbic])	3.9524*	4.2462*	21.6600	0.1790	5.7194	549.2777	0.0817	0.0855	0.0370
	(2.3515)	(2.2933)	(27.8476)	(49.7453)	(45.6933)	(636.7139)	(0.0722)	(0.0744)	(0.0272)
var(e.roe)	144.0477	143.1314	104.1157*	4291.0001	4278.7293	3887.3467	0.4214	0.4212	0.4072
	(93.0639)	(91.4932)	(58.1243)	(3216.2185)	(3189.7804)	(2540.9892)	(0.2638)	(0.2626)	(0.2503)
Constant	11.7165***	11.9152***	6.2592	27.8914***	29.8350***	7.9817	0.4505***	0.4272***	−1.1892
	(1.3780)	(1.5161)	(4.5370)	(5.4776)	(7.1721)	(25.0214)	(0.1496)	(0.1299)	(1.2139)
Observations	5123	5123	4984	5135	5135	4958	5123	5123	4945
Number of groups	11	11	11	11	11	11	11	11	11

methodological choices have on the evidence produced and therefore spark academic debate and strengthen the evidence base (Peels and Bouter, 2018).

In the broader literature on this topic, conflicting findings have also emerged. Chen and Wang (2011) looked at the association between CSR activities and three financial performance indicators (return on assets (ROA), return on sales and growth rate of sales) in Chinese firms between 2007 and 2008 and found an overall positive effect. Focusing on US companies and on environmental activities, Liu et al. (2020) employed a multi-level regression approach and also found an overall positive effect on ROA. Fahad and Busru (2021) instead found evidence for a negative association between ESG and ROA in analysing a cohort of listed companies in India. Han et al. (2016) used three separate ESG scores as proxies for corporate CSR activities and assessed whether they would predict financial performance measured as return on equity (ROE), price earnings ratio (PER) and market price within companies listed in the Korean stock exchange market. Heterogenous results were estimated for the individual ESG scores, with no evidence for the social pillar to affect financial performance.

Han et al. (2016) utilized three distinct ESG scores as proxies for CSR activities to assess their ability to predict financial performance, measured by Return on Equity (ROE), Price-Earnings Ratio (PER), and market price, within companies listed on the Korean stock exchange market. Heterogeneous results were obtained for individual ESG scores, and there was no indication that the social pillar had an impact on financial performance.

However, the study presented some limitations that need to be acknowledged. Although a series of model selection and specifications were implemented, this study does not claim causality. The models were developed to help explain and understand the relationship between ESG and financial performance, an association which could be of bi-directional nature (Hamdi et al., 2022), though beyond the scope of this research. The generalisability of these findings needs to be evaluated in line with the influence of company size, being listed in a top index and legislative and normative context can have both in terms of sustainability reporting and heterogeneity of financial performance. In this respect, this study purposively focused on the European context and on large, listed companies, to provide comparative results on entities for which reliable information is available and reliable. However, it must be also recognised that systematic differences exist between ESG and financial performance providers (Berg et al., 2022), which may induce a certain degree of bias in the estimation.

6. Conclusions

The relationship between ESG and financial performance mong listed companies in Europe is characterised by marked heterogeneity which is largely unobserved and future research should employ non-linear and causal inference models to address this issue. To examine the generalisability of these findings future endeavours should consider replicating the analytical approach presented in this study in other settings such as small and medium-size enterprises, normative contexts and using alternative sources of company data, including qualitative-level dimensions of sustainability.

CRediT authorship contribution statement

Paolo Candio: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Table 3
Effect of ESG scores on financial performance indicators - market-based metrics

	EPS			PER			PRICE		
Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
ESG score	−0.0162	–	–	0.1442	–	–	−0.3338	–	–
	(0.1271)	–	–	(0.2127)	–	–	(0.2587)	–	–
Environmental	–	0.1891	0.1576	–	−0.6172**	−0.5548**	–	0.5804***	0.4095*
	–	(0.1780)	(0.2021)	–	(0.3045)	(0.2730)	–	(0.2052)	(0.2212)
Social	–	−0.4380	−0.5803*	–	0.7205*	0.8067*	–	−0.0576	−0.5734
	–	(0.3032)	(0.3358)	–	(0.3747)	(0.4164)	–	(0.6980)	(0.4165)
Governance	–	0.2629*	0.3941**	–	0.0735	0.0723	–	−1.1281	−0.1346
	–	(0.1547)	(0.1736)	–	(0.1411)	(0.1350)	–	(0.9902)	(0.3620)
lnrev	–	–	3.5110	–	–	−3.4972	–	–	−5.7608
	–	–	(6.8042)	–	–	(4.1058)	–	–	(4.8211)
lnta	–	–	−7.0028**	–	–	1.3177	–	–	−31.7660***
	–	–	(3.4317)	–	–	(3.2227)	–	–	(8.9107)
lnmc	–	–	40.7503	–	–	−20.8905***	–	–	25.9867
	–	–	(37.3141)	–	–	(7.6705)	–	–	(32.0366)
lnmv	–	–	−31.9490	–	–	15.7834**	–	–	35.6409
	–	–	(37.6860)	–	–	(7.1332)	–	–	(30.4882)
leverage	–	–	0.0359	–	–	0.3292	–	–	0.2038
	–	–	(0.1062)	–	–	(0.2866)	–	–	(0.4522)
beta	–	–	−1.5855	–	–	12.7128	–	–	−6.0594
	–	–	(1.8236)	–	–	(19.3664)	–	–	(10.1155)
bvps	–	–	0.0375	–	–	0.0012	–	–	0.4020***
	–	–	(0.0275)	–	–	(0.0008)	–	–	(0.0161)
mtbv	–	–	−0.0056	–	–	−0.0016	–	–	0.0186
	–	–	(0.0125)	–	–	(0.0177)	–	–	(0.0268)
var(id[icbic])	0.0012**	0.0014*	0.0010**	<0.0001	<0.0001	<0.0001	0.0071*	0.0073*	0.0032
	(0.0006)	(0.0008)	(0.0004)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0041)	(0.0038)	(0.0021)
var(_cons[icbic])	207.0515***	224.4539***	139.3096***	64.9283	26.0208	22.3189	2506.6636*	2344.0160**	791.1608**
	(43.9891)	(57.9592)	(43.7921)	(94.5555)	(55.0367)	(40.6305)	(1286.6911)	(1038.3298)	(402.0751)
var(e.roe)	23,623.2460	23,568.7762	23,382.1339	49,693.3255***	49,586.5321***	50,533.8491***	103,477.5334	102,989.3731	34,621.4197**
	(16,854.4572)	(16,786.6291)	(16,473.5986)	(16,199.2117)	(16,144.5797)	(16,494.7986)	(73,239.5390)	(72,617.9187)	(13,873.6388)
Constant	28.6849***	29.2710***	−271.8795	29.4228**	23.9674*	218.1840***	96.0623***	110.8452***	−58.8213
	(11.1178)	(10.7390)	(330.6265)	(13.6341)	(13.2208)	(56.4179)	(31.9641)	(40.8162)	(231.9490)
Observations	5139	5139	4998	4766	4766	4642	5142	5142	4982
Number of groups	11	11	11	11	11	11	11	11	11

Table 4
Moderating effect of CSR strategy and stakeholder engagement.

	CSRSTRAT						CSRSE					
Variables	ROE	ROA	EBITM	EPS	PER	PRICE	ROE	ROA	EBITM	EPS	PER	PRICE
total ESG score	−0.0330	−0.0013	0.0010	−0.5254**	−0.1467	−0.1904	−0.0061	0.0361*	0.0023	−0.5001	0.6422	0.6924
	(0.0995)	(0.0289)	(0.0016)	(0.2567)	(0.2270)	(0.5258)	(0.1184)	(0.0205)	(0.0022)	(0.4336)	(0.4962)	(0.6174)
stakeh. engag.	−0.1069	−0.0187	0.0037**	1.0543*	0.0200	0.4055	10.3428	4.9638***	0.3053	70.3621**	14.0027	25.7090
	(0.1983)	(0.0309)	(0.0017)	(0.5459)	(0.5270)	(0.3065)	(12.0771)	(1.8901)	(0.2228)	(27.5077)	(38.9663)	(33.4385)
csrstrat | csrse #esgscore	0.0016	0.0003	−0.0001*	−0.0059	0.0044	−0.0054	−0.1616	−0.0637**	−0.0037	−0.0445	−0.1744	−0.7169
	(0.0024)	(0.0003)	(0.0001)	(0.0051)	(0.0080)	(0.0048)	(0.1804)	(0.0251)	(0.0030)	(0.4318)	(0.5404)	(0.6016)
lnrev	16.0336	2.6832	−0.2129*	3.4141	−2.7841	−5.4247	27.8790	4.9424	−0.0672	−5.8479	−5.5612	−17.4668*
	(13.3883)	(2.6308)	(0.1114)	(6.3816)	(4.3959)	(4.7729)	(22.9799)	(4.4629)	(0.0978)	(8.6890)	(6.3007)	(9.9464)
lnta	−30.3353	−8.1921**	0.0592	−7.0503**	−1.3959	−30.0089***	−46.2812	−11.0515*	−0.0129	−10.5673	7.1263	−25.6960**
	(20.9775)	(4.1561)	(0.0405)	(2.8563)	(4.0931)	(9.0081)	(34.5095)	(6.7136)	(0.0619)	(7.9863)	(6.3115)	(12.7938)
lnmc	12.4528	5.3948***	0.3488	37.5443	−23.1617***	27.0741	18.3410	5.4143*	0.0515	−24.3117	−35.8351***	3.8194
	(8.3952)	(1.6514)	(0.2475)	(33.8646)	(5.9585)	(32.3019)	(15.2372)	(3.2065)	(0.0478)	(40.2604)	(12.6930)	(28.7780)
lnmv	5.3932**	0.5245	−0.1934	−29.0786	18.2500***	34.3236	6.8464**	1.3924	0.0389	34.1989	19.5925*	50.8623
	(2.2446)	(0.3287)	(0.1814)	(34.1860)	(5.4294)	(31.7267)	(2.9920)	(0.9192)	(0.0255)	(39.2916)	(10.8324)	(34.8057)
leverage	0.1067	−0.0392	0.0007	−0.0327	0.3133	0.1852	0.1778	−0.0374	0.0024	−0.1414	0.7042	0.1617
	(0.1521)	(0.0239)	(0.0016)	(0.1035)	(0.3059)	(0.4446)	(0.2084)	(0.0268)	(0.0024)	(0.3275)	(0.5700)	(0.4248)
Beta	−1.6484	0.6296	0.0276	−2.4539	12.4708	−5.8866	−1.5407	0.5350	−0.0049	9.0779	17.5139	−19.7316
	(2.9070)	(0.6942)	(0.0268)	(1.8830)	(19.5595)	(9.8973)	(4.3933)	(1.0855)	(0.0166)	(7.2406)	(34.4192)	(13.3866)
bvps	−0.0004*	−0.0002*	−0.0000	0.0367	0.0010	0.4021***	−0.0094	0.0048	0.0000	1.8674***	−0.0005	1.5180**
	(0.0002)	(0.0001)	(0.0000)	(0.0271)	(0.0008)	(0.0162)	(0.0232)	(0.0058)	(0.0001)	(0.4813)	(0.0274)	(0.7128)
mtbv	0.1442	0.0264	−0.0001	0.0009	−0.0002	0.0188	0.1328	0.0240	−0.0000	0.0016	0.0006	0.0195
	(0.2311)	(0.0334)	(0.0001)	(0.0104)	(0.0158)	(0.0259)	(0.2111)	(0.0296)	(0.0001)	(0.0094)	(0.0240)	(0.0221)
var(id[icbic])	0.0018	0.0001	0.0000	0.0012	0.0000	0.0032	0.0041*	0.0002**	0.0000	0.0052	0.0000	0.0012
	(0.0011)	(0.0000)	(0.0000)	(0.0008)	(0.0000)	(0.0022)	(0.0022)	(0.0001)	(0.0000)	(0.0034)	(0.0000)	(0.0008)
var(_cons[icbic])	598.4275	24.0645	0.0353	173.2296***	56.5460	833.9052**	1403.2211	48.1251	0.0647	550.4204*	199.4468	1270.9553
	(717.6156)	(32.0194)	(0.0295)	(48.2560)	(84.0465)	(425.2060)	(1802.5703)	(68.6047)	(0.0501)	(319.1360)	(281.8903)	(1028.0781)
Constant	17.5369	7.4870*	−1.3429	−251.8146	278.8852***	−107.7539	−13.0371	7.9929	0.0819	312.9017	334.0715***	175.0715
	(18.7881)	(4.2731)	(1.1624)	(302.2554)	(57.4565)	(237.3336)	(36.3144)	(8.7305)	(0.3089)	(363.8603)	(103.0683)	(274.8527)
Observations	4958	4984	4945	4998	4642	4982	2569	2595	2575	2601	2428	2594
Number of groups	11	11	11	11	11	11	11	11	11	11	11	11

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *<0.1.

Table 5
Moderating effect of external audit and sustainability committee.

	CSRSEA						CSRSC					
Variables	ROE	ROA	EBITM	EPS	PER	PRICE	ROE	ROA	EBITM	EPS	PER	PRICE
total ESG score	−0.0091	0.0107	−0.0011	−0.2288	1.1672	1.9603***	−0.0061	0.0361*	0.0023	−0.5001	0.6422	0.6924
	(0.0833)	(0.0344)	(0.0029)	(0.1966)	(0.8114)	(0.6939)	(0.1184)	(0.0205)	(0.0022)	(0.4336)	(0.4962)	(0.6174)
external audit	−1.0893	0.7505	0.1519	32.5233	52.8428	170.9245***	10.3428	4.9638***	0.3053	70.3621**	14.0027	25.7090
	(6.4717)	(2.6179)	(0.2766)	(31.9742)	(48.8761)	(30.0056)	(12.0771)	(1.8901)	(0.2228)	(27.5077)	(38.9663)	(33.4385)
csrsea | csrsc #esgscore	0.0255	−0.0025	−0.0011	−0.2430	−0.8688	−2.7967***	−0.1616	−0.0637**	−0.0037	−0.0445	−0.1744	−0.7169
	(0.0920)	(0.0377)	(0.0034)	(0.4143)	(0.8289)	(0.5868)	(0.1804)	(0.0251)	(0.0030)	(0.4318)	(0.5404)	(0.6016)
lnrev	3.9009	−0.0449	−0.2460**	3.8665	−0.2326	−1.9451	27.8790	4.9424	−0.0672	−5.8479	−5.5612	−17.4668*
	(3.2859)	(0.6630)	(0.0961)	(7.0211)	(5.1818)	(3.6977)	(22.9799)	(4.4629)	(0.0978)	(8.6890)	(6.3007)	(9.9464)
lnta	−11.6514***	−4.0656***	0.0731***	−7.4803*	−6.4628	−35.4763***	−46.2812	−11.0515*	−0.0129	−10.5673	7.1263	−25.6960**
	(4.0815)	(0.9355)	(0.0196)	(4.4904)	(4.0648)	(11.8946)	(34.5095)	(6.7136)	(0.0619)	(7.9863)	(6.3115)	(12.7938)
lnmc	5.3082**	3.9824***	0.3264	62.2795	−24.4300***	41.0593	18.3410	5.4143*	0.0515	−24.3117	−35.8351***	3.8194
	(2.3291)	(0.5237)	(0.2406)	(40.6761)	(6.6487)	(29.7468)	(15.2372)	(3.2065)	(0.0478)	(40.2604)	(12.6930)	(28.7780)
lnmv	5.0336**	0.2103	−0.1603	−51.4827	20.8008**	18.1021	6.8464**	1.3924	0.0389	34.1989	19.5925*	50.8623
	(2.3246)	(0.4174)	(0.1743)	(45.2962)	(8.2353)	(35.9947)	(2.9920)	(0.9192)	(0.0255)	(39.2916)	(10.8324)	(34.8057)
leverage	0.0575	−0.0622***	−0.0003	0.1735	0.7460*	0.6230	0.1778	−0.0374	0.0024	−0.1414	0.7042	0.1617
	(0.0715)	(0.0134)	(0.0013)	(0.2820)	(0.4461)	(0.6461)	(0.2084)	(0.0268)	(0.0024)	(0.3275)	(0.5700)	(0.4248)
beta	−2.7787	0.2108	0.0432	0.9312	24.2038	−13.5805	−1.5407	0.5350	−0.0049	9.0779	17.5139	−19.7316
	(3.0699)	(0.4871)	(0.0329)	(2.9620)	(28.3535)	(13.9028)	(4.3933)	(1.0855)	(0.0166)	(7.2406)	(34.4192)	(13.3866)
bvps	−0.0006*	<0.0001	<-0.0001	0.0965	0.0025*	0.5553***	−0.0094	0.0048	0.0000	1.8674***	−0.0005	1.5180**
	(0.0003)	(0.0004)	<0.0001	(0.1266)	(0.0015)	(0.0600)	(0.0232)	(0.0058)	(0.0001)	(0.4813)	(0.0274)	(0.7128)
mtbv	−0.0394**	−0.0004	(<0.0001)	0.0015	−0.0083	0.0459**	0.1328	0.0240	−0.0000	0.0016	0.0006	0.0195
	(0.0176)	(0.0007)	<0.0001	(0.0084)	(0.0199)	(0.0232)	(0.2111)	(0.0296)	(0.0001)	(0.0094)	(0.0240)	(0.0221)
var(id[icbic])	0.0008	<0.0001	(<0.0001)	0.0010	<0.0001	0.0000	0.0041*	0.0002**	0.0000	0.0052	0.0000	0.0012
	(0.0010)	(<0.0001)	(<0.0001)	(0.0014)	(<0.0001)	(0.0009)	(0.0022)	(0.0001)	(0.0000)	(0.0034)	(0.0000)	(0.0008)
var(_cons[icbic])	205.7700	2.6398	0.0328	139.0883	117.3719	760.3046	1403.2211	48.1251	0.0647	550.4204*	199.4468	1270.9553
	(183.3580)	(1.8981)	(0.0287)	(262.7334)	(141.2584)	(623.3410)	(1802.5703)	(68.6047)	(0.0501)	(319.1360)	(281.8903)	(1028.0781)
Constant	18.5741	7.8281	−0.8627	−450.0644	238.8439***	−284.0529	−13.0371	7.9929	0.0819	312.9017	334.0715***	175.0715
	(17.0578)	(4.9305)	(1.2723)	(355.8511)	(84.7376)	(240.2730)	(36.3144)	(8.7305)	(0.3089)	(363.8603)	(103.0683)	(274.8527)
Observations	3676	3693	3688	3706	3414	3688	2569	2595	2575	2601	2428	2594
Number of groups	11	11	11	11	11	11	11	11	11	11	11	11

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix I

Table OLS – Financial statement variables

	ROA			ROE			EBITM		
Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
ESG score	−0.0800***	–	–	−0.1838***	–	–	−0.0027***	–	–
	(0.0097)	–	–	(0.0515)	–	–	(0.0005)	–	–
Environmental	–	−0.0483***	0.0489***	–	−0.0637	0.1574***	–	−0.0001	0.0008
	–	(0.0098)	(0.0094)	–	(0.0525)	(0.0562)	–	(0.0006)	(0.0006)
Social	–	−0.0341***	−0.0784***	–	−0.1891***	−0.3467***	–	−0.0021***	−0.0002
	–	(0.0118)	(0.0110)	–	(0.0633)	(0.0657)	–	(0.0007)	(0.0007)
Governance	–	−0.0024	0.0275***	–	0.0461	0.1154**	–	−0.0004	0.0002
	–	(0.0090)	(0.0082)	–	(0.0480)	(0.0489)	–	(0.0005)	(0.0005)
lnrev	–	–	−0.9298***	–	–	−0.7341	–	–	−0.2877***
	–	–	(0.1719)	–	–	(1.0279)	–	–	(0.0105)
lnta	–	–	−4.1408***	–	–	−10.9460***	–	–	0.1150***
	–	–	(0.1472)	–	–	(0.8751)	–	–	(0.0090)
lnmc	–	–	4.0946***	–	–	5.5503	–	–	0.3274***
	–	–	(0.7451)	–	–	(4.4636)	–	–	(0.0453)
lnmv	–	–	1.0539	–	–	8.5529*	–	–	−0.1883***
	–	–	(0.7523)	–	–	(4.5082)	–	–	(0.0457)
leverage	–	–	−0.0813***	–	–	−0.0898	–	–	0.0019***
	–	–	(0.0099)	–	–	(0.0606)	–	–	(0.0006)
beta	–	–	0.4059	–	–	−3.3948	–	–	0.0193
	–	–	(0.3590)	–	–	(2.1540)	–	–	(0.0217)
bvps	–	–	−0.0003	–	–	−0.0010	–	–	−0.0000
	–	–	(0.0002)	–	–	(0.0014)	–	–	(0.0000)
mtbv	–	–	0.0300***	–	–	0.1608***	–	–	0.0000
	–	–	(0.0023)	–	–	(0.0142)	–	–	(0.0001)
Constant	12.1691***	12.5131***	15.7826***	29.8464***	31.9677***	53.1582	0.4612***	0.4553***	−0.7966**
	(0.6525)	(0.6683)	(5.4140)	(3.4818)	(3.5728)	(32.4383)	(0.0371)	(0.0381)	(0.3290)
Observations	5123	5123	4984	5135	5135	4958	5123	5123	4945
R-squared	0.0132	0.0193	0.2576	0.0025	0.0051	0.0790	0.0049	0.0048	0.1460

Standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1; Analysis conducted on the top 600 companies listed in the STOXX 600 index for the last decade (2012–2022).

Table OLS – capital market variables

	EPS			PER			PRICE		
Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
ESG score	−0.0184	–	–	0.1656	–		−0.1964	–	–
	(0.1210)	–	–	(0.1821)	–		−0.2539	–	–
Environmental	–	0.1954	0.2033	–	−0.6300***	−0.5603***	–	0.4748*	0.3741**
	–	(0.1232)	(0.1333)	–	(0.1852)	(0.2028)	–	−0.2578	−0.1629
Social	–	−0.3982***	−0.6264***	–	0.7454***	0.8235***	–	0.2665	−0.6561***
	–	(0.1481)	(0.1556)	–	(0.2216)	(0.2369)	–	−0.3109	−0.1902
Governance	–	0.2009*	0.3592***	–	0.0683	0.0716	–	−1.2562***	−0.1617
	–	(0.1126)	(0.1158)	–	(0.1680)	(0.1754)	–	−0.2369	−0.1419
lnrev	–	–	4.2797*	–	–	−3.8136	–	–	−4.9276*
	–	–	(2.4391)	–	–	(3.7775)	–	–	−2.9884
lnta	–	–	−7.5110***	–	–	1.1624	–	–	−26.3339***
	–	–	(2.0714)	–	–	(3.1632)	–	–	−2.5353
lnmc	–	–	41.2891***	–	–	−20.2383	–	–	23.9443*
	–	–	(10.5397)	–	–	(16.2611)	–	–	−12.9622
lnmv	–	–	−33.0650***	–	–	15.8109	–	–	32.9617**
	–	–	(10.6402)	–	–	(16.4533)	–	–	−13.0724
leverage	–	–	0.0603	–	–	0.3321	–	–	−0.1645
	–	–	(0.1406)	–	–	(0.2168)	–	–	−0.1723
beta	–	–	−0.9644	–	–	12.0177	–	–	1.1589
	–	–	(5.1391)	–	–	(8.1988)	–	–	−6.2282
bvps	–	–	0.0379***	–	–	0.0012	–	–	0.4017***
	–	–	(0.0034)	–	–	(0.0049)	–	–	−0.0041
mtbv	–	–	−0.0058	–	–	−0.0007	–	–	0.0084
	–	–	(0.0332)	–	–	(0.0487)	–	–	−0.0406
Constant	28.3391***	29.2774***	−273.7310***	26.5841**	22.6499*	214.1554*	88.2814***	104.9181***	−87.9271
	(8.1954)	(8.4109)	(76.6078)	(12.3119)	(12.6285)	(118.1297)	−17.1616	−17.5917	−94.2001
Observations	5139	5139	4998	4766	4766	4642	5142	5142	4982
R-squared	0.0000	0.0016	0.0372	0.0002	0.0031	0.0052	0.0001	0.0059	0.6765

Standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1; Analysis conducted on the top 600 companies listed in the STOXX 600 index for the last decade (2012–2022).

Table XTREG – Financial statement variables

	ROA			ROE			EBITM		
Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
ESG score	−0.0396***	–	–	−0.2379***	–	–	0.0012	–	–
	(0.0098)	–	–	(0.0754)	–	–	(0.0009)	–	–
Environmental	–	−0.0310***	−0.0115	–	−0.1777***	−0.0979	–	0.0003	0.0009
	–	(0.0096)	(0.0095)	–	(0.0660)	(0.0703)	–	(0.0007)	(0.0008)
Social	–	−0.0044	−0.0098	–	0.0029	−0.0662	–	−0.0006	−0.0004
	–	(0.0100)	(0.0097)	–	(0.0716)	(0.0745)	–	(0.0008)	(0.0008)
Governance	–	−0.0158**	0.0029	–	−0.0800	−0.0433	–	−0.0003	−0.0004
	–	(0.0073)	(0.0071)	–	(0.0529)	(0.0547)	–	(0.0006)	(0.0006)
lnrev	–	–	0.6609**	–	–	2.9023	–	–	−0.2802***
	–	–	(0.2927)	–	–	(1.7827)	–	–	(0.0174)
lnta	–	–	−4.3072***	–	–	−12.5162***	–	–	0.1157***
	–	–	(0.2731)	–	–	(1.5994)	–	–	(0.0152)
lnmc	–	–	3.0466***	–	–	2.2492	–	–	0.2568***
	–	–	(0.6174)	–	–	(4.7910)	–	–	(0.0528)
lnmv	–	–	0.8499	–	–	10.5397**	–	–	−0.1026*
	–	–	(0.6039)	–	–	(4.7379)	–	–	(0.0525)
leverage	–	–	−0.1462***	–	–	−0.1752**	–	–	−0.0002
	–	–	(0.0117)	–	–	(0.0866)	–	–	(0.0009)
beta	–	–	−0.5727**	–	–	−3.4020	–	–	−0.0159
	–	–	(0.2865)	–	–	(2.2386)	–	–	(0.0247)
bvps	–	–	0.0002	–	–	−0.0005	–	–	−0.0000
	–	–	(0.0004)	–	–	(0.0026)	–	–	(0.0000)
mtbv	–	–	0.0098***	–	–	0.0940***	–	–	0.0000
	–	–	(0.0016)	–	–	(0.0126)	–	–	(0.0001)
Constant	9.5349***	10.1693***	15.7666***	33.3711***	34.1481***	67.0332*	0.2041***	0.3284***	−0.4499
	(0.6439)	(0.7463)	(5.3555)	(4.9580)	(4.6518)	(38.2736)	(0.0575)	(0.0518)	(0.4086)
Observations	5123	5123	4984	5135	5135	4958	5123	5123	4945
Number of id	591	591	581	590	590	580	590	590	580

Standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1; Analysis conducted on the top 600 companies listed in the STOXX 600 index for the last decade (2012–2022).

Table XTREG – Capital markets variables

	EPS			PER			PRICE		
Variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
ESG score	0.4698**	–	–	0.0598	–	–	1.6608***	–	–
	(0.2123)	–	–	(0.3212)	–	–	(0.1774)	–	–
Environmental	–	0.0688	0.0185	–	−0.2618	−0.3199	–	0.6701***	0.0795
	–	(0.1557)	(0.1655)	–	(0.2906)	(0.3092)	–	(0.1816)	(0.1288)
Social	–	−0.1813	−0.3354*	–	0.3035	0.3140	–	0.3339*	−0.1061
	–	(0.1773)	(0.1832)	–	(0.3069)	(0.3222)	–	(0.1848)	(0.1306)
Governance	–	0.3123**	0.3721***	–	0.0126	−0.0505	–	0.6557***	0.3294***
	–	(0.1326)	(0.1351)	–	(0.2254)	(0.2344)	–	(0.1359)	(0.0962)
lnrev	–	–	6.1337*	–	–	−8.8060	–	–	3.3209
	–	–	(3.4933)	–	–	(9.1084)	–	–	(5.0664)
lnta	–	–	−6.3023**	–	–	8.0224	–	–	−21.0793***
	–	–	(3.0276)	–	–	(8.1909)	–	–	(5.0527)
lnmc	–	–	19.9654*	–	–	−22.1666	–	–	16.7808**
	–	–	(11.9632)	–	–	(20.8052)	–	–	(8.3137)
lnmv	–	–	−13.9828	–	–	20.3151	–	–	50.5094***
	–	–	(11.9668)	–	–	(20.5189)	–	–	(8.0736)
leverage	–	–	−0.0910	–	–	0.7676**	–	–	0.9704***
	–	–	(0.1861)	–	–	(0.3821)	–	–	(0.1689)
beta	–	–	−1.2869	–	–	4.9346	–	–	−11.8184***
	–	–	(5.7216)	–	–	(10.0128)	–	–	(3.8084)
bvps	–	–	0.0457***	–	–	0.0002	–	–	0.5141***
	–	–	(0.0049)	–	–	(0.0124)	–	–	(0.0069)
mtbv	–	–	−0.0009	–	–	−0.0047	–	–	0.0224
	–	–	(0.0320)	–	-	(0.0510)	–	–	(0.0219)
Constant	−3.5574	14.3859	−159.4405*	33.4926	41.5411*	201.0849	−32.7928***	−21.8543	−406.2824***
	(13.9912)	(10.7176)	(90.3505)	(21.1365)	(21.6565)	(173.3969)	(11.6724)	(19.2318)	(82.8878)
Observations	5139	5139	4998	4766	4766	4642	5142	5142	4982
Number of id	588	588	579	585	585	576	590	590	580

Standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1; Analysis conducted on the top 600 companies listed in the STOXX 600 index for the last decade (2012–2022).

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