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Corporate environmental, social, and governance activities and financial reporting quality: An international investigation

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ABSTRACT

This paper examines the impact of firms' environmental, social, and governance (ESG) activities on financial reporting quality (FRQ). The study uses 45,877 firm-year observations from 65 countries between 2003 and 2021. In the research model, firm characteristics and macroeconomic and institutional structure characteristics of the countries are controlled for. This study finds that firms with higher ESG scores have higher FRQ. Additionally, our mediation analysis indicates that financial distress costs serve as a crucial mechanism through which ESG influences FRQ. Our findings are robust after accounting for alternative measures of FRQ, different sampling scenarios, endogeneity issues, and simultaneity bias.

1. Introduction

Financial reporting quality (FRQ) plays a crucial role in building an influential foundation of communication and trust between firms and their stakeholders. Investors may effectively analyze the financial health and return potential of a firm with the presentation of accurate, reliable, and transparent financial information. It also has an impact on several crucial areas, including an assessment of firm's loan applications by lenders, investment choices by individuals, and compliance inspections by regulators (Garcia-Blandon et al., 2018; Nwaobia et al., 2013; Vander Bauwhede et al., 2015). However, misleadingly positive image in financial by several firms, such as Enron, Parmalat, and WorldCom, through manipulating financial reports and subsequently precipitating significant corporate bankruptcies damaged public confidence in the quality of the financial reports. The erosion of public confidence in FRQ has prompted extensive academic research into the factors that influence this crucial aspect, as all stakeholders recognize its paramount importance (see Biddle et al., 2009; Chen et al., 2011; Costello & Wittenberg-Moerman, 2011; Delgado-Domonkos & Zeng, 2023; Gomariz & Ballesta, 2014; Ham et al., 2017; Hope et al., 2020; Reid et al., 2019; Wang et al., 2018).

Environmental, social, and governance (ESG) activities have become more significant in today's business environment and global economy. The requirement that firms change how they do business and consider environmental, social, and ethical obligations, not simply financial success, is the main reason that ESG considerations remain on the agenda. ESG factors are vital for measuring and managing firms' sustainability performance and social impact (Clementino & Perkins, 2021; Ionescu et al., 2019). This heightened significance stems from growing public demand for increased transparency, ethical conduct, and socially responsible behavior by businesses over time. As a result of this transformation, ESG has become an important step in enhancing firms' long-term success, managing risks, reducing social and environmental impacts, and responding to investors' and consumers' expectations.

ESG factors reflect how firms respond to these societal expectations. Because ESG reflects firms' environmental impacts, responsibility to society, and ethical practices, it is inevitable that it will also affect presentation of a firm's financial information. ESG-focused firms mostly tend to have better corporate governance and transparency standards (Kumar, 2020). This can increase the reliability of financial information presentations. In this context, the fact that ESG factors reflect firms' ethical values, sustainability efforts, and corporate governance approaches indicates a strong relationship with FRQ.

How ESG activities affect FRQ is an important question. Firms' ESG performance has now become an important evaluation criterion, going beyond traditional financial performance measurements. This situation emphasizes that firms should not only focus on profitability but also meet the various expectations of their stakeholders. However, greed,

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which causes firms to make an intense effort to reap profit, can cause firms to share misleading information about their financial situations and ignore social and environmental problems, which may lead to ethical concerns, sustainability problems, and income inequality. Many famous firm scandals in the past also resulted in this situation, such as the Lehman Brothers scandal in 2008, the Volkswagen emissions scandal in 2015, the Wirecard scandal in 2020, and the Adani Group scandal in 2022.

Misleading financial disclosures and practices can lead to mistrust, shake financial systems, and cause crises. To eliminate this devastating effect of corporate scandals, both voluntary incentive mechanisms and obligatory practices are implemented by the regulators. Society has also begun to move to more stakeholder-oriented firms. For this reason, it is important to manage greed in a balanced way, to be transparent to the public, and to fulfill social responsibility. This is in line with stakeholder theory as well, because firms should consider all stakeholders' expectations, not just those of shareholders. ESG also supports firms' stakeholder-oriented approach. Firms that operate in a more stakeholder-oriented way become more transparent and accountable and adopt ethical behavior toward their stakeholders. In this way, they can avoid misleading the public and publish more accurate financial reports. Also, we think that it will increase FRQ. Our motivation for performing this research is to gain insights into the effect on FRQ from the increase in ESG activities. We argue that engagement in ESG-oriented activities has the potential to enhance FRQ, as it compels companies to provide greater transparency regarding their governance, sustainability efforts, and ethical practices.

In this paper, we investigate the impact of ESG on FRQ using 45,877 firm-year observations between 2003 and 2021, covering 65 countries. We use empirical models that take into account control variables related to firm characteristics (i.e., firm size, firm age, leverage, liquidity, tangibility, and return on assets) and countries' macroeconomic and institutional characteristics. We estimate our empirical models with ordinary least squares regression. Our empirical findings illustrate the positive influence of ESG factors on FRQ. In addition to the overall ESG score, individual components (i.e., E, S, and G) and 8 subcomponents also have a positive and significant impact on FRQ. In other words, as the ESG score of the firms increases, FRQ also increases. Our findings are supported by stakeholder theory. One of the basic principles of stakeholder theory is that firms shape their management decisions by absorbing the expectations and needs of all their stakeholders (Freeman, 1984). ESG factors also enable firms to add more value to broader stakeholder groups and present how these factors affect the firm's financial performance more transparently. Information asymmetry is reduced by providing stakeholders with more information about the firm, both financial and nonfinancial. Increasing ESG practices enables firms to adopt a more comprehensive and holistic approach within the framework suggested by stakeholder theory. Additionally, our mediation analysis indicates that financial distress costs serve as a crucial mechanism through which ESG influences FRQ. We also use generalized method of moments (GMM) to consider endogeneity in empirical models and support the accuracy of our findings. In addition, we support the accuracy of our findings with alternative FRQ measurements and different samples.

This study contributes to the literature by investigating how the adoption of a sustainability-oriented management style using ESG affects a firm's FRQ. First, we extend the stakeholder theory literature by examining the potential impact on FRQ when firms shape their activities with all stakeholders in mind. In the current literature, some studies investigate the effect of ESG activities on FRQ. These studies have focused on an individual country (Ben Amar & Chakroun, 2018; Chulkov & Wang, 2023; Ghaleb et al., 2021; Gras-Gil et al., 2016; Grimaldi et al., 2020; Velte, 2019) or a specific region (Ani, 2021; Chouaibi & Zouari, 2022; Dimitropoulos, 2020; Gaio et al., 2022; Kyaw et al., 2017). These studies were conducted within a constrained and narrow sample period. We draw our sample from 65 countries between 2003 and 2021 and investigate the impact of ESG on FRQ using an up-to-date and worldwide data set. In addition, using 10 different ESG subcomponents, we analyze the related relationship in more detail than previous studies. To build on previous studies, we look at how the COVID-19 pandemic, which deeply changed firm dynamics, affects this relationship. In addition, we consider how the developmental levels of countries impact our findings. Finally, we look at the impact of differences in the institutional environments of countries. As a result, we find that ESG positively affects FRQ in all conditions. This finding can make a significant contribution to many different areas in the business world and the global economy. First, by adopting a sustainable approach, firms can both transform the way in which they do business and increase FRQ. For investors, the positive impact of ESG factors on FRQ can lead investors to invest in more sustainable firms. At the same time, regulators can take steps to establish or update standards in this area, considering the positive impact of ESG factors on FRQ.

After this introduction, the paper is organized as follows. In Section 2, the theoretical framework is presented, and the hypothesis is developed. In Section 3, the methodology of the research is given in detail. In Section 4, the empirical results are described, and the hypothesis is tested. In Section 5, various robustness tests are conducted to evaluate the robustness of these results. Section 6 is the conclusion, with a discussion.

2. Theoretical framework and hypothesis development

Financial reports are documents that show the financial position and performance of an organization for a certain period. These reports include the firm's revenues, expenses, assets, liabilities, and capital structure. Essentially, they give us information about the financial health and financial success of the firm. Through financial reports, firms with good performance can be distinguished from those with poor performance, and decision-makers can make decisions more easily (Healy & Wahlen, 1999). The primary purpose of financial reporting is to provide useful information for decision-making (Choi & Pae, 2011). Therefore, in order for accurate and effective decisions to be made based on financial reports, these reports need to adhere to specific standards and maintain a certain level of quality.

FRQ is a concept addressed from different perspectives in the literature. The International Accounting Standards Board (IASB) explains the FRQ as characteristics that ensure that the information in financial reports is useful (IASB, 1989): understandability, relevance, reliability, and comparability. Financial reports that give users comprehensive and transparent information without any ulterior motives are regarded as being of high quality (Jonas & Blanchet, 2000). FRQ represents the transfer of transparent and complete financial information to users (Bajra & Čadež, 2018) and is a measure of how well a firm's financial reports convey its financial status and performance throughout the measurement period (Greenwood & Tao, 2021).

The quality of financial reports is of great significance as it has a positive and significant impact on all stakeholders (Anto & Yusran, 2023). High-quality financial reports boost the likelihood that current and potential stakeholders will make wise investments by enabling them to allocate resources efficiently (Beest et al., 2009). Firms can attract more investors with high-quality financial reports (Hariani & Fakhrorazi, 2021). In addition, low FRQ may also have undesirable consequences for firms. Moreover, the quality of a firm's information flow network declines, which increases information asymmetry (Brown & Hillegeist, 2007) and decreases firm liquidity (Chen et al., 2019; Majidipour et al., 2017).

FRQ is not easy to measure and directly observe and is the subject of many studies with different indicators (Hariani & Fakhrorazi, 2021). One of these indicators is whether the firm engages in earnings management (EM), in which shareholders or managers intervene in the external financial reporting process to obtain additional profit (Schipper, 1989). EM affects only firm owners but also everyone who is a

stakeholder in the firm (Prior et al., 2008). Managers give stakeholders misleading information about the firm's economic performance by altering financial reports (Healy & Wahlen, 1999). Firm managers can use their discretion over accounting figures to present earnings in a way that benefits them without violating generally accepted accounting principles (Watts & Zimmerman, 1986). Because of the overconfidence of external stakeholders in the firm's accounting figures, managers might manipulate earnings for their own benefit. Thus, incorrect information about the firm can be conveyed without contravening accounting standards (Abdul Rahman & Haneem Mohamed Ali, 2006).

The gradual increase in global awareness and social expectations shows that it is insufficient for companies to focus only on financial performance and that they must focus on nonfinancial information as well. Financial crises, events such as terrorism and war that disrupt the peace, climate changes, and health crises such as the COVID-19 pandemic, have turned the attention of stakeholders to nonfinancial information, so they have started to demand that firms offer explanations on nonfinancial issues related to their sustainability (Saijad, 2021). To meet this demand, firms use ESG disclosures to increase their accountability (Eccles et al., 2014). ESG reports are seen as a measure of transparent reflection of the firm's performance (Weber, 2014). Managers of firms operating sustainably are expected to be honest, reliable, and ethical (Kim et al., 2012). Therefore, these managers tend to give their stakeholders more transparent information and try to prevent EM (Scholtens & Kang, 2013).

Stakeholder theory argues that firms should be managed by considering not only their shareholders but also all stakeholders who interact with the firm (Freeman, 1984). In addition to activities aimed at increasing shareholders' profit, focusing on the interests of other stakeholders is important in stakeholder theory (Aydoğmuş et al., 2022). Consistent with the theory, managers portray their firms as environmentally conscious to prevent a conflict of interest or disagreement with their stakeholders and refrain from engaging in socially unacceptable unethical behavior such as EM (Kim et al., 2012). The adoption of stakeholder theory guides managers on how to run a business and how to relate to stakeholders so that the firm can achieve its goals (Freeman, 2000). Additionally, it ensures that firms adopt effective management techniques (Russo & Perrini, 2010). In line with the theory, adopting ESG activities can enhance a firm's reputation and financial performance and create synergies that will lead to better sustainability (Peng & Isa, 2020). Firms with high ESG scores can achieve higher-quality earnings with lower information asymmetry because they have a good corporate reputation and more information flow (Bilyay-Erdogan, 2022).

Firms that consider the environment in which they are located are expected to report more accurate earnings figures to their stakeholders (Kim et al., 2012). Velte (2019) examines the relationship between ESG performance and EM at firms listed in the German Prime Standard between 2011 and 2017. He finds that ESG performance has a negative impact on EM. In other words, EM decreases at firms with high ESG performance, and thus the FRQ also increases. Using data on firms in 24 European Union countries between 2003 and 2018, Dimitropoulos (2020) investigates how firms' CSR performance affects EM. Supporting Velte's results, other papers have found a negative relationship between CSR and EM and that firms with high CSR performance have higher FRQ. Ghaleb et al. (2021) investigate the relation between CSR and EM using 475 firm-year observations of trades on the Amman stock exchange between 2011 and 2016, finding that CSR has a negative relationship with EM.

In addition to these studies, research undertaken in various countries and at the international level has clarified the relationship between ESG variables and FRQ—for example, Spain (Gras-Gil et al., 2016), the United Kingdom (Almahrog et al., 2018), France (Ben Amar & Chakroun, 2018), Korea (Yoon et al., 2019), Egypt (Mohmed et al., 2019), Italy (Grimaldi et al., 2020), Gulf Arab countries (Ani, 2021), and the United States (Chulkov & Wang, 2023). They have reveal that ESG positively affects FRQ.

Overall, firms that operate in accordance with ESG tend to operate by considering not only financial results but also environmental and social impacts. Stakeholder theory predicts that firms with higher ESG performance have less information asymmetry. From the perspective of stakeholder theory, we expect companies that embrace sustainability-focused business strategies to align their financial reporting process with their ethical principles, prioritizing transparency, and, consequently, firms with higher ESG performance have higher FRQ.

Hypothesis 1. Firms with a higher ESG score have higher-quality financial reporting.

3. Methodology

3.1. Sample

We analyze the impact of ESG on FRQ with data on firm-specific variables from the Refinitiv Eikon database, macroeconomic data from the World Bank, and country-level legal data from La Porta et al. (1998), excluding financial and utilities firms. We winsorized all firm-level continuous variables at 1 percent and 99 percent level. As a result, our sample consists of 45,877 firm-year observations from 65 countries between 2003 and 2021. Although we use firm-year data for the period 2002–2021, lagged values are used when calculating the FRQ variable, therefore, the analysis covers only the period 2003–2021. The distribution of the sample at a country basis is given in Appendix 1, and the distribution on a sectoral basis is given in Appendix 2.

3.2. Measuring financial reporting quality

Following the literature (Acar, 2023; Al-Shaer, 2020; Dimitropoulos, 2020; Habbash & Haddad, 2020; Ryu et al., 2021; Toukabri & Kateb, 2023; Velte, 2019), we proxy our dependent variable, financial reporting quality, with the performance-matched Jones model developed by Kothari et al. (2005). Kothari et al. (2005) includes ROA in the adjusted Jones model developed by Dechow et al. (1995), which was based on the model originally developed by Jones (1991). Kothari et al. (2005) analyzes changes in EM practices when a firm's performance is higher or lower than the average in the industry.

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0\left(\frac{1}{A_{it-1}}\right) + \alpha_1\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + \alpha_2\left(\frac{PPE_{it}}{A_{it-1}}\right) + \alpha_3(ROA_{it}) + \varepsilon_{it} \quad (1)$$

TA: Total accruals are described as the difference in net income after tax and operating cash flows (OCF).

A: a firm's total assets.

ΔREV: change in the firm's net revenue.

ΔREC: change in the firm's net accounts receivable.

PPE: the firm's gross property, plant, and equipment.

ROA: return on assets, that is, the firm's net income divided by total assets

ε_{it}: residuals.

Our measure of FRQ is the residual of Model 1. We take the absolute value of the residuals. To facilitate interpretation, following Chen et al. (2011) and Kusnadi et al. (2016), we multiply the absolute value of the residuals from the model by −1. The closer the absolute residuals are to zero, the higher the FRQ is.

3.3. Empirical model

To test the relationship between ESG and FRQ, we construct the following model.

$$FRQ_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 Control_{it} + \beta_3 Year_{it} + \beta_4 Industry_{it} + \beta_5 Country_{it} + \varepsilon_{it} \quad (2)$$

where i is firms, and y is years. Our dependent variable, FRQ_{it}, is financial reporting quality. Our independent variable, ESG_{it}, is the firm's overall ESG score and its components. $Control_{it}$, shows firm-specific, institutional, and macroeconomic control variables. First, we add Size, Leverage, ROA, Liquidity, Tangibility, and Age variables to control for firm characteristics. We then include Legal_UK as to control for institutions. Legal origin can affect firms' financial reporting standards, accountability rules, and the way in which they present their financial information. Additionally, La Porta et al. (1998) state that legal origin includes information about countries on issues such as private property rights, contract law, and investor protection. Kothari (2000) and Hope (2003) also state that the quality of accounting practices and standards must be high for the information in financial reports to be of high quality. Therefore, based on relevant studies, we include Legal_UK as a control variable for factors that we cannot control in the countries where the firms are located.

We enhance the model by using the gross domestic product (GDP) as a macroeconomic control variable. GDP is an important measure of a country's economic development (Henderson et al., 2012). In periods of high GDP growth, firms may tend to present more favorable results in their financial reports because of growth pressure. In addition, in a rapidly developing and changing world, firms may tend to present false or inaccurate information in their financial reports as they try to keep up with these changes. Chen et al. (2020) argue that the authorities in provinces with lagging GDP growth are more likely to pressure firms to engage in EM to increase GDP. Therefore, FRQ is negatively affected by these conditions. For these reasons, we follow other studies (Acar, 2023; Cai et al., 2022; Chen et al., 2020; Dimitras et al., 2015; Lee et al., 2023; Martens et al., 2021; Shen & Chih, 2005) and add GDP to the model as a control variable. Moreover, because we use a panel dataset, we also consider the year-, industry-, and country-fixed effects to capture differences across periods, sectors, and countries included in the analysis. Detailed definitions of the variables are given in Table 1.

Table 1
Variables definitions.

Variables	Variables Definition	Source
Dependent Variable		
FRQ	How financial reporting quality is measured is discussed in 3.2.	Kothari et al. (2005)
Independent Variables		
ESG	ESG is the ESG score of firms that includes environmental, social, and corporate governance components.	Refinitiv Eikon
Control Variables		
Firm Level		
Size	Firm Size is defined as the natural logarithm of total assets.	Refinitiv Eikon
Age	Firm age is the natural logarithm of the firm's age.	Refinitiv Eikon
Lev	Leverage is defined as the ratio of total debt to total assets.	Refinitiv Eikon
Liquidity	Liquidity is defined as the ratio of current assets to short-term liabilities.	Refinitiv Eikon
ROA	ROA is defined as net income before extraordinary items divided by total assets.	Refinitiv Eikon
Tangibility	Asset tangibility is defined as the net property, plant, and equipment divided by total assets.	Refinitiv Eikon
Macroeconomic Level		
GDP	The GDP growth rate of each country (annual %)	World Bank
Institutional		
Legal_UK	Legal origin is a dummy variable equal to 1 for common law countries and 0 for civil law countries.	La Porta et al. (1998)

3.4. Descriptive statistics

Table 2 shows the number of observations, mean, standard deviation, median, minimum, and maximum values of the variables. The mean of FRQ is −0.05; it varies between −0.06 and 0.00, with a median value of −0.04. Because as the FRQ value approaches zero, the quality of financial reporting increases, our findings indicate that FRQ is high on average. The average ESG overall score is 42.28, varying between a minimum of 0.40 and a maximum of 96.06. Hence, the sustainability performance of the firms in our sample is at a moderate level. The average environmental, social, and governance components are 32.56, 45.99, and 48.74, respectively. This suggests that firms attach more importance to governance issues than the other two components. The average firm size is 22.03. The average leverage is 0.25, indicating that the firms in our sample finance their assets with debt at a ratio of 0.25 on average. The average ROA is 0.04, and firms are profitable on average. The liquidity average is 2.05, and the firms' current assets are twice their short-term debts on average. The average Tangibility is 0.29, indicating that, on average, 0.29 of the asset structure of firms consists of physical assets. The average age is 3.52.

The correlation matrix presented in Table 3 shows the relationships between the variables. There is a positive relationship between FRQ and ESG and its subcomponents at the 0.01 significance level. This preliminary evidence strengthens our insights by indicating that a positive relationship exists, as we predicted in our hypothesis. A correlation coefficient above 0.70 among the variables in the regression model indicates a potential multicollinearity problem. Moreover, in untabulated results, variance inflation factors were calculated, with values below the threshold level of 5. Thus, no problem of multicollinearity between the variables is found.

4. Empirical results

Table 4 reports our main results on the impact of the ESG overall score and its three components on FRQ. Columns (1)–(4) present the findings using the ESG overall score and environmental, social, and governance scores as independent variables, respectively.

First, we look at R^2 and evaluate the signs and statistical significance of the control variables. All the models are statistically valid and have a significant predictive power over FRQ. The coefficient of size is positive and statistically significant at the 0.01 level in all models. Firms with a larger structure generally have stronger internal control and audit mechanisms, which allows financial reporting processes to be managed more appropriately and regularly (Carcello & Hermanson, 2005). In addition, as a firm increases in size, it may be pressured to become more reputable because its corporate reputation in the eyes of the public is well known (Kaur & Singh, 2021). The coefficient of ROA is positive and statistically significant at the 0.01 level in all models. A high ROA indicates that firms are operationally effective, their management quality is high, and their financial performance is based on solid foundations

Table 2
Descriptive statistics.

	N	Mean	SD	Median	Min	Max
FRQ	45877	−0.05	0.06	−0.04	−0.36	0.00
ESG	45877	45.27	20.81	44.51	0.40	96.06
ENV	45806	36.11	27.66	35.00	0.00	98.27
SOC	45876	49.26	23.92	48.94	0.11	100
GOV	45877	50.96	22.22	51.56	0.25	99.48
Size	45877	22.03	1.61	22.05	17.29	25.75
Lev	45877	0.25	0.18	0.24	0.00	0.83
ROA	45877	0.04	0.12	0.05	−0.75	0.29
Liquidity	45877	2.05	1.90	1.53	0.24	16.68
Tangibility	45877	0.29	0.23	0.23	0.00	0.93
Age	45877	3.52	0.77	3.47	1.39	4.88
GDP	45877	2.12	3.45	2.30	−11.15	25.16
Legal_UK	45877	0.58	0.49	1.00	0.00	1.00

Table 3
Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12	13
FRQ	**1**	1												
ESG	**2**	0.16	1											
ENV	**3**	0.18	0.86	1										
SOC	**4**	0.14	0.90	0.76	1									
GOV	**5**	0.10	0.68	0.41	0.45	1								
Size	**6**	0.24	0.48	0.53	0.42	0.29	1							
Lev	**7**	0.02	0.09	0.08	0.08	0.04	0.25	1						
ROA	**8**	0.25	0.15	0.18	0.12	0.13	0.30	−0.07	1					
Liquidity	**9**	−0.09	−0.20	−0.23	−0.17	−0.12	−0.35	−0.34	−0.22	1				
Tangibility	**10**	0.07	0.01	0.04	0.00	0.05	0.11	0.23	0.04	−0.20	1			
Age	**11**	0.13	0.18	0.25	0.14	0.10	0.20	−0.06	0.19	−0.15	**0.00**	1		
Legal_UK	**12**	−0.06	−0.10	−0.23	−0.04	**−0.01**	−0.21	0.03	−0.11	0.13	0.05	−0.24	1	
GDP	**13**	−0.02	−0.07	−0.08	−0.08	**0.01**	0.03	−0.03	0.09	**−0.01**	−0.01	−0.07	−0.02	1

Note: Coefficients in bold are statistically insignificant at the 0.10 level. Other coefficients are statistically significant at the 0.01 and 0.05 levels.

Table 4
The impact of ESG on FRQ.

VARIABLES	(1)	(2)	(3)	(4)
	FRQ	FRQ	FRQ	FRQ
Size	0.006***	0.006***	0.007***	0.007***
	(22.96)	(22.99)	(25.39)	(29.30)
Lev	0.002	0.003	0.002	0.002
	(1.10)	(1.30)	(0.90)	(0.79)
ROA	0.108***	0.108***	0.108***	0.108***
	(21.79)	(21.84)	(21.83)	(21.78)
Liquidity	−0.000	−0.000	−0.000	−0.000
	(-0.35)	(-0.48)	(-0.46)	(-0.46)
Tangibility	0.019***	0.019***	0.019***	0.019***
	(13.01)	(12.85)	(13.04)	(12.99)
Age	0.004***	0.004***	0.004***	0.004***
	(9.82)	(9.86)	(10.29)	(10.24)
GDP	−0.001***	−0.001***	−0.001***	−0.001***
	(-4.76)	(-4.73)	(-4.78)	(-4.93)
Legal_UK	0.041*	0.018	0.042*	0.042*
	(1.79)	(0.70)	(1.80)	(1.82)
ESG	**0.00014*** **			
	(8.34)			
ENV		**0.00010*** **		
		(7.97)		
SOC			**0.00007*** **	
			(5.04)	
MAN				**0.00009*** **
				(6.94)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes
Constant	−0.267***	−0.255***	−0.268***	−0.280***
	(-12.19)	(-11.09)	(-12.48)	(-12.66)
Observations	45,877	45,806	45,876	45,877
R-squared	0.142	0.141	0.141	0.141

Note: Explanations regarding the variables are given in Table 1. All continuous variables were winsorized at the 1 99 level. ***p < 0.01, **p < 0.05, *p < 0.1. Robust t-statistics in parentheses.

(Chan & Karim, 2010; Oberholzer, 2012). Hence, when firms' profitability ratios rise in relation to their assets, it may have a positive impact on FRQ. The coefficient of Tangibility is positive and statistically significant at the 0.01 level in all models. The physical assets owned by firms enable their financial situation to be reflected more accurately by providing a more concrete and accurate presentation of their value in financial statements (Hunter et al., 2005). Therefore, as the physical assets of firms increase as a share of their total assets, FRQ also increases. The coefficient of Age is positive and statistically significant at the 0.01 level in all models. Firms that have been in business for many years have the time to put more effort into improving and optimizing their financial processes (Sapprasert & Clausen, 2012). Additionally, firms with a long history often have more experience and experts than other firms (Petruzzelli et al., 2018). Therefore, thanks to the experience gained over the years, they can obtain better opportunities to prepare financial reports more accurately and up to standard. So, as a firm ages, its FRQ also increases. A significant relationship between leverage and liquidity with FRQ is not found. The GDP coefficient is negative and statistically significant at the 0.01 level in all models. Because of economic growth pressure on firms, they might try to make the firm look better by manipulating its financial indicators.

Additionally, firms may make changes in their financial reports to demonstrate better financial performance in order to maintain their competitive advantage in their industry during growth periods. In addition, they may follow strategies to reassure investors and stakeholders by presenting their performance as better than it is so as to improve their corporate reputation. For all these reasons, it is not surprising that, as the GDP growth rate of countries increases, the FRQ of firms declines. Chen et al. (2020) also find that EM is greater and FRQ is lower in regions with low GDP growth. The coefficient for Legal_UK is positive in all models and statistically significant at the 0.10 level in all columns except Column (2). Legal systems have a more flexible structure in countries with common law traditions than in civil law countries (Ma, 2012). In addition, shareholders and investors have a stronger influence in these countries (Dayanandan et al., 2016), which might enable firms to report their financial information with greater transparency and integrity. In addition, stronger protection of shareholders and a more developed litigation culture may lead firms to be more responsible and to present their financial reports honestly. Therefore, the FRQ of firms is higher in common law countries.

Among the independent variables, the main focus of interest, the coefficients (*t* values) are 0.0001412 (8.34) for ESG in Column (1), 0.0001021 (7.97) for the environmental score in Column (2), 0.0000725 (5.04) for the social score in Column (3), and 0.0000901 (6.94) for the governance score in Column (4). The coefficients of the ESG overall score and the three components are statistically significant and positive at the 0.01 level. These findings show that ESG and its components have a positive impact on FRQ. That is, when the ESG and components scores are higher, FRQ is higher. The results support our hypothesis. Our results align with previous research on the relationship between ESG and FRQ (Almahrog et al., 2018; Chulkov & Wang, 2023; Gras-Gil et al., 2016; Grimaldi et al., 2020; Yoon et al., 2019). As a result, firms with ESG-focused activities tend to engage in activities that deceive their stakeholders or mislead the market to a small extent.

To strengthen our findings, we conduct analyses using the 10 subcomponents of the ESG score as independent variables. Table 5 shows the results on the impact of the 10 subcomponents of ESG on FRQ. Almost all its components have a positive effect on FRQ. The effects of all components, except the workforce and shareholder score, are statistically significant at the 0.01 level. These results support our main hypothesis. The resource use score, a component of the environmental score, has the most impact on FRQ.

The resource use score, which is a component of the environmental

Table 5
The impact of ESG components on financial reporting quality.

Panel A: Dependent Variable: FRQ										
	Environmental			Social				Governance		
	RES	EMS	EIS	WFS	HRS	CMS	PRS	MNS	SHS	CSR
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ESG	**0.00067*** (6.67)**	**0.00005*** (5.85)**	**0.00006*** (6.87)**	0.00000 (0.63)	**0.00005*** (6.18)**	**0.00004*** (4.33)**	**0.00007*** (8.28)**	**0.00007*** (7.07)**	0.00000 (0.42)	**0.00004*** (4.17)**
Controls	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	45,876	45,876	45,806	45,876	45,876	45,876	45,876	45,877	45,877	45,877
Adjusted R^2	0.141	0.141	0.140	0.140	0.1410	0.141	0.141	0.141	0.140	0.141

Note: Explanations regarding the variables are given in Table 1. All continuous variables were winsorized at the 1 99 level. ***p < 0.01, **p < 0.05, *p < 0.1. Robust t-statistics in parentheses.

score, has the largest effect on FRQ. This is consistent with the conclusion that the environmental score affects FRQ more than the social and governance score. Taken together, the prominent role of the environmental dimension is critical for understanding how sensitive firms are to environmental factors and how these factors affect FRQ. It shows that firms' focus on environmental sustainability strategies is an effective way to improve their FRQ. In particular, the determining role of the resource use score in this effect can be considered a critical element of firms' interactions with natural resources and resource management strategies on FRQ. It reveals that firms' focus on reducing their environmental footprint, increasing their productivity, and using natural resources more effectively can have positive financial results. Consequently, one can infer that companies with greater sensitivity to the environment are also more inclined to provide high-value relevance financial statement information.

5. Additional analysis: The impact of ESG on FRQ through the cost of financial distress

The cost of financial distress undermines a firm's ability to continue operating and can cause significant harm to owners, creditors, and other stakeholders (Wruck, 1990). When a firm is in financial distress, lenders can demand higher interest rates. In addition, firms might need to sell their assets. However, in that situation, assets are often sold at low prices (fire sale) (Shleifer & Vishny, 1992), which can lead to losses in the value of a firm's assets. Financial distress can also damage a firm's reputation (Ghazali et al., 2015). Customers, suppliers, and other business partners may have a negative perception of the firm's financial position. These costs indicate that firms need to continuously monitor their financial position and manage financial risks effectively. Firms that engage in ESG activities generally improve their management in terms of environmental, social, and corporate governance, which can affect their financial risks. Effective management of ESG activities can increase a firm's resilience to environmental, social, and managerial challenges in the future, reducing the cost of financial distress by increasing financial stability (Widarwati & Sartika, 2019). Firms in financial distress may make changes to their financial reports in various ways to make their conditions look better, but doing so can negatively affect FRQ. We hypothesize that firms with high ESG activities will have lower costs due to financial distress and, therefore, higher FRQ. We perform a mediation analysis to test this hypothesis (see Li et al., 2023; Zhao & Niu, 2023). Following the literature, we use three proxies to measure the cost of financial distress: ROA, Tangibility, and Risk (Deesomsak et al., 2004; Frank & Goyal, 2009).

Fig. 1 shows that ESG can affect FRQ in two possible ways: direct and indirect. The direct effect is the path from ESG to FRQ without the cost of financial distress. The second path is the indirect effect, first, from ESG to the cost of financial distress and, then, from the cost of financial distress to FRQ. The mediating effects model consists of the following three equations.

$$M_{it} = \alpha + \beta_1 ESG_{it} + Control_{it} + Year_{it} + Industry_{it} + Country_{it} + \varepsilon_{1it} \quad (3)$$

$$FRQ_{it} = \alpha + \beta_2 ESG_{it} + \gamma_2 M_{it} + Control_{it} + Year_{it} + Industry_{it} + Country_{it} + \varepsilon_{2it} \quad (4)$$

$$FRQ_{it} = \alpha + \beta_3 ESG_{it} + Control_{it} + Year_{it} + Industry_{it} + Country_{it} + \varepsilon_{3it} \quad (5)$$

M_{it} refers to mediator variables, including ROA, Tangibility, and Risk (firm risk measured as the absolute difference between the percentage change compared to the previous year and the average of this change), respectively. The definitions of other variables are explained in Model 2 and Table 1. Model 3 was constructed to confirm the effect of ESG score on the mediating variables (ROA, Tangibility, and Risk) and represents the first step of the mediation analysis. Model 4 tests the mediating effect of the mediating variables on the relationship between ESG score and FRQ and is the second step of the mediation effect analysis. Model 5 has the same function as Model 2 to confirm the impact of ESG activities on FRQ. Here, the indirect effect is estimated by multiplying β_1 in Model 3 by γ_2 in Model 4. β_2 in Model 4 represents the direct effect of ESG on

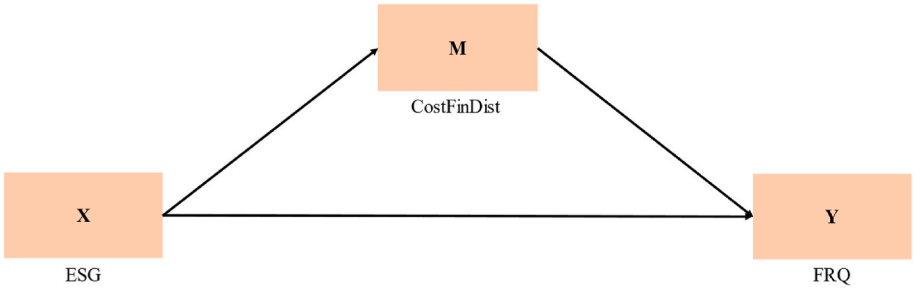

Fig. 1. The conceptual diagram of the financial distress costs mechanism.

FRQ. β_3 in Model 5 represents the total effect of ESG on FRQ.

First, we consider the mediating effect of ROA. Panel A in Table 6 shows the results of the test of the mediation mechanism of ROA. Columns (1)–(3) show the estimation results of Models 3, 4, and 5, respectively. Because the mediating variable is the same as the control variable, ROA is excluded from Column (3), which shows the results of the main regression testing the impact of ESG on FRQ. In Column (1), β_1 is 0.0001709. The coefficient indicates that ROA increases by 0.0001709 when the ESG score increases by one percentage point. This indicates that, as the ESG score increases, ROA also increases. In Column (2), γ_2 on the effect of ROA on FRQ is 0.1079837. It shows that ROA has a positive relationship with FRQ. Thus, we obtain the indirect effect of ESG on FRQ by multiplying β_1 by γ_2 (0.0001709 × 0.1079837 = 0.00001845441433). When ESG increases by one percentage point, the mechanism through which ESG affects FRQ through ROA leads to an increase in FRQ of 0.00001845441433. Column (2) reports the direct effect of ESG on FRQ. The significantly positive direct effect of ESG (β_2 = 0.0001412) indicates that, when ESG is higher, firms with the same level of ROA have higher FRQ. Column (3) gives the total effect of ESG on FRQ—that is, β_3 = 0.0001596 (=0.00001845441433 + 0.0001412). This shows that the effect of ESG on FRQ can be considered a combination of direct and indirect effects, and the proportion of indirect effect in the total effect is 11.6 percent.

Second, we consider the mediating effect of Tangibility. Panel B in Table 6 presents the results of the test for the mediation mechanism of Tangibility. Columns (1)–(3) show the estimation results of Models 3, 4, and 5, respectively. Because the mediating variable is the same as the control variable, Tangibility is excluded from Column (3), our main regression testing the impact of ESG on FRQ. In Column (1), β_1 is 0.0001103. The coefficient indicates that, when the ESG score increases by one percentage point, Tangibility increases by 0.0001103. This indicates that, as the ESG score increases, Tangibility also increases. In Column (2), γ_2 for the effect of Tangibility on FRQ is 0.0188609, which shows that Tangibility has a positive relationship with FRQ. Thus, the indirect effect of ESG on FRQ is 0.00000208035727 (0.0001103 × 0.0188609). When ESG increases by one percentage point, the mechanism through which ESG affects FRQ via Tangibility leads to an increase in FRQ of 0.00000208035727. Column (2) reports the direct effect of ESG on FRQ. The significantly positive direct effect of ESG (β_2 = 0.0001412) indicates that, when ESG is higher, firms with the same level of Tangibility have higher FRQ. Column (3) gives the total effect of ESG on FRQ. That is, β_3 = 0.0001392 (=0.00000208035727 + 0.0001412), showing that the effect of ESG on FRQ can be considered a combination of direct and indirect effects, and the proportion of indirect effects in the total effect is 1.4519487 percent.

Finally, we consider the mediating effect of Risk. Panel C in Table 6 shows the results of the test for the mediation mechanism of Risk. Columns (1)–(3) show the estimation results of Models 3, 4, and 5, respectively. In Column (1), β_1 is −0.6244240. The coefficient shows that when ESG score increases by one percentage point, Risk decreases by 0.6244240. In Column (2), γ_2 for the impact of Risk on FRQ is −0.0000065, showing that Risk has a negative relationship to FRQ. Thus, the indirect effect of ESG on FRQ is 0.000004058756 (−0.6244240 × −0.0000065). When ESG increases by one percentage point, the mechanism through which ESG affects FRQ via Risk results in an increase in FRQ of 0.000004058756. Column (2) reports the direct impact of ESG on FRQ. The significantly positive direct effect of ESG (β_2 = 0.0001384) indicates that, when ESG is higher, firms with the same level of Risk have higher FRQ. Column (3) gives the total effect of ESG on FRQ—that is, β_3 = 0.00014246 (=0.000004058756 + 0.0001384). This shows that the effect of ESG on FRQ can be considered a combination of direct and indirect effects, and the proportion of indirect effect in the total effect is 2.8490496 percent.

Table 7 estimates the size of the three mediating variables, showing that ROA has the largest effect. This finding shows that ROA is the most important way in which ESG affects FRQ. This may directly affect FRQ, given that ROA is an indicator of firm profitability and asset efficiency as well as a firm's ability to manage financial risk because, for investors and stakeholders, a good financial performance is important for a firm's reliability. In addition, high ROA levels indicate that the firm has strong financial reliability and may support more reliable and consistent financial reporting. ROA is a measure that generally focuses more on expectations in financial markets and investor interests. However, Tangibility and Risk focus more on the firm's internal operating structure. Therefore, it is possible that ROA makes expectations and investor interest in financial markets more evident.

Table 6
ESG and FRQ: The mechanism of cost of financial distress.

Panel A: Mediating Variable ROA			
	(1)	(2)	(3)
	ROA	FRQ	FRQ
ESG	0.0001709***	0.0001412***	0.0001596***
	(5.86)	(8.34)	(9.35)
ROA		0.1079837***	
		(21.79)	
Control	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
Observations	45,877	45,877	45,877
Adjusted R^2	0.161	0.142	0.105
Panel B: Mediating Variable TANGIBILITY			
	(1)	**(2)**	**(3)**
	TANGIBILITY	**FRQ**	**FRQ**
ESG	0.0001103**	0.0001412***	0.0001432***
	(2.01)	(8.34)	(8.44)
Tangibility		0.0188609***	
		(13.01)	
Control	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
Observations	45,877	45,877	45,877
Adjusted R^2	0.349	0.142	0.138
Panel C: Mediating Variable RISK			
	(1)	**(2)**	**(3)**
	RISK	**FRQ**	**FRQ**
ESG	−0.6244240***	0.0001384***	0.0001424***
	(-3.74)	(8.19)	(8.41)
RISK		−0.0000065***	
		(-10.39)	
Control	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
Observations	45,820	45,820	45,820
Adjusted R^2	0.042	0.146	0.142

6. Robustness tests

We conduct robustness tests to show that the relationship between ESG and FRQ is not affected by our research design or sample selection and check whether our main findings hold. We begin our robustness tests using alternative measures of FRQ. Table 8 shows the impact of ESG

Table 7
Mediating effects.

Variable	Mediating Effect
ROA	11.6%
Tangibility	1.45%
RISK	2.85%

Note: Calculated by the authors based on the regression results.

Table 8
Alternative FRQ measure.

VARIABLES	(1) Dec1995	(2) MS2008
ESG	**0.00016*** **	**0.00003*** **
	(8.47)	**(4.29)**
Size	−0.002***	0.003***
	(-5.67)	(25.12)
Lev	−0.004	0.005***
	(-1.60)	(6.98)
ROA	−0.257***	0.001
	(-51.96)	(0.74)
Liquidity	−0.004***	0.001***
	(-14.77)	(13.24)
Tangibility	0.109***	0.022***
	(61.46)	(38.71)
Age	−0.004***	0.001***
	(-8.90)	(3.50)
GDP	−0.001***	−0.000**
	(-2.69)	(-2.25)
Legal_UK	−0.013	0.061
	(-0.29)	(0.00)
Constant	0.025	−0.139***
	(0.00)	(-5.26)
Year effects	Yes	Yes
Industry effects	Yes	Yes
Country effects	Yes	Yes
Observations	45,200	49,339
R-squared	0.339	0.090

Note: In FRQ measurement, Dechow et al., 1995 was used in Model 1 and McNichols and Stubben (2008) was used in Model 2. Explanations regarding the variables are given in Table 1. All continuous variables were winsorized at the 1 99 level. ***p < 0.01, **p < 0.05, *p < 0.1. Robust t-statistics in parentheses.

Table 9
Alternative model specifications.

VARIABLES	(1) System-GMM	(2) Lagged Effect
FRQ	**0.152*** **	
	(9.92)	
ESG	**0.00064*** **	**0.00009*** **
	(2.70)	**(5.39)**
Size	−0.008	0.008***
	(-0.97)	(30.73)
Lev	0.018	0.008***
	(0.75)	(3.56)
ROA	0.028	0.090***
	(0.62)	(20.47)
Liquidity	0.002	0.001***
	(0.76)	(4.86)
Tangibility	0.088***	0.014***
	(2.62)	(9.53)
Age	0.045**	0.004***
	(2.00)	(9.79)
GDP	0.003	−0.0001***
	(1.59)	(-3.66)
Legal_UK		−0.000
		(-0.00)
Constant	−0.068	−0.280
	(-0.47)	(0.00)
Year effects	Yes	Yes
Industry effects	Yes	Yes
Country effects	Yes	Yes
Observations	38,213	45,809
Number of Firms	5,705	6,863
R-squared		0.138
AR (1) Test	0.000	
AR (2) Test	0.334	
Hansen Test	0.775	

Note: In column (2), all independent variables except GDP and Legal_UK are lagged by one year. Explanations regarding the variables are given in Table 1. All continuous variables were winsorized at the 1 99 level. ***p < 0.01, **p < 0.05, *p < 0.1. Robust t-statistics in parentheses.

on our alternative FRQ measures. In Column (1), the dependent variable is based on the Dechow et al. (1995) model, whereas in Column (2), we use the model developed by McNichols and Stubben (2008). The calculation of these models is given in Appendix 3. Our ESG coefficient is positive and statistically significant at the 0.01 level in both models. This supports our main results. The positive and statistically significant relationship between FRQ and ESG holds with alternative measurements.

The endogeneity problem can make it difficult to obtain accurate results in statistical analyses. Therefore, we next use a system generalized method of moments (system-GMM) model to check for the presence of an endogeneity problem (Arellano & Bover, 1995; Blundell & Bond, 1998). This method is used to avoid issues caused by heteroskedasticity and autocorrelation in panel data using estimates of robust standard errors. Lagged FRQ is treated as a predetermined variable and instrumented by lags of one to nine periods. ESG and other firm-level variables are treated as endogenous and instrumented with their lags of two to four periods. GDP, Legal_UK, and other fixed-effect dummy variables are treated as exogenous and instrumented by their instruments. The matrix of instruments has been collapsed. The *p* value of the Hansen test is 0.775. The *p* values of the AR(1)/AR(2) tests are 0.000 and 0.334, respectively. These statistics confirm that the model selection is appropriate, and the instruments are valid. Column (1) in Table 9 shows our system-GMM results.

Third, to reduce concern about simultaneous bias, we rerun our analyses using one-year lagged values of all our independent variables at the firm level. This allows us to estimate the current conditions based on the past and, at the same time, to evaluate future impacts. Column (2) of Table 9 gives the results of our lagged effects, and they continue to support our main findings. Consequently, our results are robust to endogeneity issues and simultaneity bias.

Observations with a large sample may carry more weight than observations with a smaller sample. Using the weighted least squares (WLS) method, we include such weighted data in the analysis in a more balanced way. Therefore, we employ WLS to see whether the differences in the number of observations of the countries in our dataset affect the results of our analysis. We use the reciprocal of the number of observations as a weight. Fifth, the US, the country with the largest number of observations in our dataset (13,862), is removed from the sample. Sixth, Japan, the country with the second-largest number of observations (3,435), was removed from the dataset. Seventh, the US and Japan were both excluded from the sample. Columns (1)–(4) in Table 10 show the results of our analysis using WLS, excluding the US, excluding Japan, and excluding both of them, respectively. In all models, the coefficient of ESG has a positive and statistically significant effect on FRQ. Based on the results of this analysis, which examines the differences in sample size, our main results continue to be valid.

Eighth, because the COVID-19 pandemic has affected the entire world, we test the impact of this shock on our results. We divide our sample into two subsamples: before and during COVID-19. Table 11 reports our results in Column (1) for the period before COVID-19, and Column (2) for the period during COVID-19. Ninth, because we use a worldwide dataset, the different characteristics of developed and emerging countries may affect our results, therefore, we conduct our analysis of them separately. The distinction between developed and emerging countries is based on the distinction by the S&P. Table 11, Column (3), presents the results for developed countries and Column (4) for emerging countries, and they show that our main findings remain the same. Tenth, we conduct separate analyses of Anglo-Saxon and continental European countries to consider the impact on our results of differences in the countries' economic, legal, and institutional structures.

In addition, we use the worldwide governance indicators (WGI) developed by Kaufmann and Kraay (2023), which comprehensively

Table 10
Weighted least square and alternative sampling.

VARIABLES	(1) WLS	(2) Excluded the U·S.	(3) Excluded Japan	(4) Excluded the U. S. and Japan
ESG	**0.00014*** (8.77)**	**0.00013*** (6.44)**	**0.00015*** (8.17)**	**0.00014*** (6.28)**
Size	0.007*** (27.96)	0.006*** (19.71)	0.006*** (22.41)	0.006*** (19.06)
Lev	−0.010*** (-5.17)	−0.003 (-1.19)	0.003 (1.29)	−0.003 (-0.89)
ROA	0.069*** (22.32)	0.089*** (12.39)	0.108*** (21.45)	0.089*** (12.16)
Liquidity	−0.001*** (-6.22)	−0.000* (-1.76)	−0.000 (-0.57)	−0.001** (-2.04)
Tangibility	0.033*** (21.61)	0.021*** (11.89)	0.018*** (12.00)	0.020*** (10.54)
Age	0.003*** (6.71)	0.003*** (6.51)	0.004*** (9.63)	0.003*** (6.33)
GDP	0.001*** (9.76)	−0.001*** (-3.47)	−0.001*** (-4.51)	−0.001*** (-3.01)
Legal_UK	−0.019*** **(-3.36)**	0.044* **(1.91)**	0.002 (0.00)	0.045* **(1.92)**
Constant	−0.194 (-0.00)	−0.267*** (-11.38)	−0.258 (-0.00)	−0.276*** (-11.24)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes
Observations	45,877	32,015	42,442	28,580
R-squared	0.176	0.121	0.139	0.116

Note: Model 1 includes WLS results. In Model 2, American firms were excluded from the sample. In Model 3, Japanese firms were excluded from the sample. In Model 4, analyzes were carried out by excluding American and Japanese firms from the sample. Explanations regarding the variables are given in Table 1. All continuous variables were winsorized at the 1 99 level. ***p < 0.01, **p < 0.05, *p < 0.1. Robust t-statistics in parentheses.

measure factors such as economic performance, the legal framework, and institutional structure, taking into account the countries' governance dimension. This index measures six different dimensions of governance: rule of law, government effectiveness, voice and accountability, political stability and absence of violence/terrorism, regulatory quality, and control of corruption. Six different indicators are combined and averaged. Then, we perform our analysis by dividing the sample into groups of countries with low WGI and high WGI. Table 11 presents the results of the analysis for common law countries in Column (5), civil law countries in Column (6), countries with low WGI scores in Column (7), and countries with high WGI scores in Column (8). It appears that the positive effect of ESG on FRQ remains. This positive effect revealed by the results emphasizes that sustainability efforts can to create value on a global scale, in countries with different legal and management models. These findings offer important guidance that firms' sustainability efforts can contribute to FRQ even in different legal contexts. In other words, this effect has global characteristics.

Finally, in Table 12, we conduct our analyses separately for each of the sectors in our sample in order to consider the impact of ESG on FRQ. Columns (1)–(9) of Table 12 show our results for academic and educational services, raw materials, consumer cyclicals, consumer non-cyclicals, energy, healthcare, industrials, real estate, and technology, respectively. In all models, ESG has a positive effect on FRQ, but the coefficients in Columns (1) and (4) are not statistically significant.

Overall, the results of the robustness checks using alternative FRQ measurements, endogeneity, similarity bias, and different sampling scenarios confirm our main findings, and they are robust. The results consistently show that ESG has a positive effect on FRQ.

7. Discussion and conclusion

ESG offers a framework for assessing how firms handle environmental impacts, social responsibilities, and ethical management practices. These criteria mean that companies have a not only to make profits but also to contribute to society and our planet. In today's business environment, ESG has become a key factor that shapes the future success of firms. In this context, the topic of how ESG factors influence reports

Table 11
Time and cross-sectional heterogeneity.

Variables	(1) BCovid	(2) DCovid	(3) developed	(4) emerging	(5) Common Law	(6) Civil Law	(7) Low WGI	(8) High WGI
ESG	**0.00011*** (6.19)**	**0.00024*** (5.80)**	**0.00011*** (5.73)**	**0.00018*** (5.02)**	**0.00007** (2.55)**	**0.00016*** (6.92)**	0.00016*** (6.68)	0.00012*** (4.81)
Size	0.006*** (20.19)	0.006*** (10.37)	0.006*** (20.19)	0.005*** (8.40)	0.007*** (17.97)	0.005*** (13.38)	0.00654*** (16.42)	0.00583*** (15.73)
Lev	0.004 (1.60)	−0.001 (-0.14)	0.003 (1.38)	−0.013*** (-2.72)	0.007*** (2.65)	−0.015*** (-4.50)	−0.00293 (-1.02)	0.00826*** (2.68)
ROA	0.111*** (18.04)	0.097*** (11.31)	0.113*** (19.66)	0.044*** (3.34)	0.134*** (21.34)	0.064*** (5.29)	0.09510*** (14.47)	0.12000*** (15.56)
Liquidity	−0.000 (-1.15)	0.001 (1.15)	0.000 (0.50)	−0.001** (-2.51)	0.000 (0.58)	−0.000 (-1.14)	0.00020 (0.55)	−0.00010 (-0.33)
Tangibility	0.017*** (11.07)	0.024*** (7.14)	0.020*** (12.14)	0.028*** (8.26)	0.013*** (6.94)	0.030*** (12.52)	0.02719*** (13.05)	0.01245*** (6.11)
Age	0.003*** (7.31)	0.006*** (6.57)	0.004*** (9.22)	0.003*** (3.16)	0.004*** (7.05)	0.004*** (5.28)	0.00513*** (7.70)	0.00304*** (6.16)
GDP	−0.001*** (-4.23)	−0.000 (-0.55)	−0.001*** (-4.19)	−0.001* (-1.72)	−0.001*** (-4.20)	−0.001*** (-3.26)	−0.00054** (-2.06)	−0.00057** (-2.16)
Legal_UK	0.024 (0.85)	−0.028*** (-3.73)	−0.010 (-0.00)	−0.021* (-1.78)				
Constant	−0.263*** (-9.98)	−0.191*** (-12.10)	−0.239 (-0.00)	−0.204*** (-12.05)	−0.257*** (-12.94)	−0.271*** (-11.04)	−0.28444*** (-12.37)	−0.22612 (-25.77)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34,247	11,630	32,759	9,752	23,251	16,436	22,939	22,938
R-squared	0.136	0.150	0.148	0.111	0.168	0.118	0.143	0.148

Note: Explanations regarding the variables are given in Table 1. All continuous variables were winsorized at the 1 99 level. ***p < 0.01, **p < 0.05, *p < 0.1. Robust t-statistics in parentheses.

Table 12
The impact of ESG on FRQ in different industrials.

VARIABLES	(1) Academic Education	(2) Basic Materials	(3) Consumer Cyclicals	(4) Consumer Non-Cyclicals	(5) Energy	(6) Healthcare	(7) Industrials	(8) Real Estate	(9) Technology
ESG	**0.00041**	**0.00018*** **	**0.00012*** **	**0.00001**	**0.00018** **	**0.00028*** **	**0.00007** **	**0.00013***	**0.00016*** **
	(0.99)	**(4.04)**	**(2.95)**	**(0.12)**	**(2.12)**	**(3.83)**	**(1.97)**	**(1.79)**	**(3.64)**
Size	0.01862***	0.00604***	0.00608***	0.00625***	0.00803***	0.00697***	0.00631***	0.00598***	0.00560***
	(3.41)	(8.48)	(9.02)	(6.80)	(7.05)	(6.41)	(11.20)	(3.38)	(8.72)
Lev	−0.06236	0.01601**	−0.00604	0.00129	−0.00428	0.01425*	−0.00047	0.00546	0.01196**
	(-1.64)	(2.31)	(-1.41)	(0.20)	(-0.48)	(1.76)	(-0.11)	(0.49)	(2.39)
ROA	0.07886	0.13991***	0.09027***	0.08700***	0.15605***	0.05606***	0.13082***	−0.12054**	0.13276***
	(1.26)	(9.70)	(6.23)	(3.54)	(9.07)	(5.64)	(8.61)	(-2.45)	(10.95)
Liquidity	0.00823	0.00071	−0.00131	−0.00072	0.00216**	0.00029	−0.00053	−0.0008	0.00093*
	(1.57)	(1.23)	(-1.57)	(-0.81)	(2.34)	(0.50)	(-1.00)	(-0.96)	(1.78)
Tangibility	0.04933	0.01508***	0.03124***	0.02031***	0.03015***	0.04519***	0.00859***	0.01945***	0.0172208***
	(1.26)	(3.27)	(9.11)	(3.95)	(4.62)	(5.08)	(3.31)	(2.72)	(3.69)
Age	−0.01821	0.00404***	0.00632***	0.00076	0.00578***	0.00524**	0.00091	−0.00117	0.01059***
	(-1.42)	(4.13)	(6.24)	(0.75)	(3.39)	(2.52)	(1.20)	(-0.78)	(8.21)
GDP	0.00423	−0.00041	0.00017	−0.00129***	−0.00167**	−0.00036	−0.00039	−0.00310***	−0.00118**
	(1.10)	(-1.06)	(0.34)	(-2.84)	(-2.23)	(-0.63)	(-1.08)	(-3.95)	(-2.37)
Legal_UK	−0.02016	−0.15470***	−0.01474	−0.00072	−0.05589***	−0.02834***	−0.06665***	0.01182	−0.01139***
	(-0.84)	(-22.59)	(-0.24)	(-0.04)	(-3.98)	(-4.21)	(-2.79)	(0.81)	(-4.56)
Constant	−0.41793***	−0.16841***	−0.23372***	−0.25646***	−0.19836***	−0.20208***	−0.16950***	−0.18940***	−0.22316***
	(-2.77)	(-9.13)	(-14.36)	(-11.46)	(-6.32)	(-8.69)	(-11.48)	(-3.96)	(-13.23)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	180	5,945	8,229	4,332	3,772	4,636	8,927	2,371	7,485
R-squared	0.421	0.218	0.120	0.128	0.225	0.181	0.134	0.206	0.155

that reflect the financial performance of firms has been a subject of ongoing research. This study investigates the effects on the quality of financial reporting of ESG factors, which are increasingly important globally.

Our analyses use a sample of firms operating in 65 different countries between 2003 and 2021. The result indicate that as ESG increases, so does FRQ. Our results align with previous findings in the literature (Almahrog et al., 2018; Chulkov & Wang, 2023; Dimitropoulos, 2020; Ghaleb et al., 2021; Gras-Gil et al., 2016; Velte, 2019). Our results demonstrate that companies' capacity to extend their focus beyond financial performance, encompassing ESG responsibilities, has growing influence on FRQ. Increases in firms' ESG scores signal expansion in sustainability-driven endeavors, signifying their adoption of a management approach focused on sustainability and transparency (Liang et al., 2022). As firms increasingly engage in ESG activities, they establish stronger relationships with their stakeholders, and these relationships have a positive impact on FRQ. Firms that engage in ESG activities can address their firm performance in more detail from a long-term perspective by reducing their harmful impacts on the environment, fulfilling their responsibilities with regard to social and ethical issues, and acting in a way that satisfies all stakeholders (Zumente & Bistrova, 2021). For this reason, firms with higher ESG performance place more importance on accuracy in the information reported in their financial statements (Arvidsson & Dumay, 2022). This improves the quality of financial reports. Because firms with high ESG scores tend to evaluate their success based not only on short-term goals but also on long-term sustainable growth, they may have incentives for providing more transparent, reliable, and accurate information.

Our results emphasize the importance of stakeholder theory and show that firms should fulfill their responsibilities toward all stakeholders and aim to create value not only for shareholders but also for society, employees, suppliers, and other stakeholders. These findings also emphasize that making sustainability principles and social responsibility a fundamental part of the business environment is critical for reliability and transparency in financial disclosures. Among the coefficients of the three components of ESG, the environmental score affects FRQ the most. Environmental factors have more concrete effects than other components. Firms are turning to ecoefficient solutions to ensure energy efficiency, reduce waste, and reduce emissions in business processes (Fiksel, 1996). The costs of these solutions are obvious. Therefore, they have less potential for EM, and this will result in higher-quality financial reports.

Our study contributes to the literature on the impact of ESG on FRQ in individual countries (e.g., Almahrog et al., 2018; Ben Amar & Wang, 2023; Gras-Gil et al., 2016; Grimaldi et al., 2020; Mohmed et al., 2019; Yoon et al., 2019). Some studies have examined this relationship on a regional basis this relationship is examined by Ani, 2021 in Gulf Arab countries, Gaio et al. (2022) in 16 European countries, Chouaibi and Zouari (2022) in 5 European countries, Dimitropoulos (2020) in European Union countries, and Aqabna et al. (2023) in the MENA region. Martinez-Ferrero et al. (2015) and López-González et al. (2019), among others, examined this relationship not on a country or region basis but on a global basis. For example, Martínez-Ferrero et al. (2015) examine the relationship between ESG and FRQ using data on 747 internationally listed firms in 25 countries over the period 2002–2010. López-González et al. (2019) use 956 international family firms in 28 countries for the period 2006–2014. Our study expands on these two studies and examines the relationship between ESG and FRQ in more detail. Many studies do not take macroeconomic and institutional-level variables into account, so our study gives a more comprehensive analysis by these variables, such as GDP and Legal_UK, to enrich understanding of this relationship. In addition, our study expands the sample range over that of previous studies, which enables us to obtain more reliable and comprehensive results with this wider dataset. Doing so leads to better understanding of the relationship between ESG and FRQ and offers further insight into the general validity of this relationship.

Our results lead to many different implications. ESG factors are important criteria that reflect not only financial performance by firms but also their environmental impact, social responsibility, and ethical values. Greater attention to ESG factors can help firms improve FRQ and earn stakeholder trust. For investors, the positive impact of ESG factors on FRQ may drive them to pay more attention to sustainability

performance and make more informed long-term investment decisions. For regulators, these results could be a call for strong standards to be established or updated. Our findings can also be an important guide in shaping future sustainability efforts in the business environment.

Future studies can investigate which factors moderate the relationship between ESG and FRQ based on firm characteristics—for instance, how increased resources and scale, as well as variations in leverage ratios, affect the connection between ESG factors and financial reporting quality. Another factor worthy of investigation is how cross-country governance factors moderate this relationship.

Finally, although the Refinitiv database is widely used in scientific research to measure ESG, other private organizations, such as Bloomberg, RepRisk, and S&P, also provide ESG scores. Because of methodological differences, repeating this study with ESG scores disclosed by other organizations could yield different results.

Author contribution statement

All authors contributed equally to the conception and design of the study, data acquisition, analysis, and interpretation, as well as drafting and critically revising the manuscript for important intellectual content. Each author has reviewed and approved the final version of the manuscript for submission.

Declaration of competing interest

I am submitting the manuscript entitled "Corporate Environmental, Social, and Governance Activities and Financial Reporting Quality: An International Investigation" for consideration as a publication in Borsa İstanbul Review.

We declare no financial and personal conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bir.2024.03.001.

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